

Guidance Booklet  
On

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STORAGE AND DISPOSAL OF  
POLYCHLORINATED  
BIPHENYL (PCB) WASTE

U.S. Department of Energy  
Office of Environmental Policy and Assistance  
RCRA/CERCLA Division (EH-413)  
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This guidance booklet has been updated to take into account the Technical Corrections to the Final Rule [64 FR 33755 of June 24, 1999] and Parts I and II of the Questions and Answers for the PCB Disposal Amendments of June 1999. The text has been reviewed by the DOE PCB Focus Group and the U.S. Environmental Protection Agency Office of Pollution Prevention and Toxic Substances. Comments made by the reviewers have been addressed.

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# PREFACE

This booklet provides a guide to the regulations of the Toxic Substances Control Act for the storage and disposal of polychlorinated biphenyl (PCB) waste at U.S. Department of Energy (DOE) facilities. It incorporates recent technical corrections to the PCB Disposal Amendments Rule [63 FR 35384 of June 29, 1998] that were published at 64 FR 33755 of June 24, 1999. This booklet replaces part of Chapter 7, “Storage,” and all of Chapter 9, “Disposal,” in the *Guidance on the Management of Polychlorinated Biphenyls (PCBs)*, DOE/EH-0350 of November 1993.

It should be used in conjunction with the regulations at 40 CFR Part 761; it is not meant to be a substitute for them. It is intended for use by field managers to aid in implementing and interpreting the regulations; it does not provide detailed specifications, operating conditions, and other procedures.

Because of the need to limit the breadth of topics covered, some minor topics have been omitted, such as PCB household waste and commercial storage of PCBs. The authors have drawn upon the comments received from the field during the rulemaking process on the PCB Disposal Amendments Rule to determine the relevance and significance of the storage and disposal topics that are covered in this booklet.

In using this guidance booklet, the reader may be tempted to go directly to a specific item of interest (e.g., a transformer) and read only the information about its storage or disposal. However, the reader is advised to read all of Chapters 1 and 2 and all of the general requirements in Chapters 3 and 4 before proceeding to a specific item. It is important to know the hierarchy of requirements that deal with the storage and disposal of any specific item. For example, before disposing a PCB-Contaminated Transformer, one first needs to know the general disposal requirements for PCB Items, PCB Articles, and PCB-Contaminated Electrical Equipment because a transformer belongs in each of those levels of hierarchy. In addition, one needs to know the separate disposal requirements for bulk PCB liquids, which must be drained from the transformer. Therefore, if one were to read only about a specific item (e.g., a transformer), one would miss much of the information that applies.

It should also be noted that the chapters on storage and disposal are not quite in parallel, although an effort was made to cover similar topics insofar as possible. The reader will find that the regulations contain special provisions and exceptions in one area that do not necessarily occur in the other area.

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DOE is grateful to the U.S Environmental Protection Agency, Headquarters, Office of Pollution Prevention and Toxic Substances, for their advice and assistance. DOE acknowledges the technical support of Energetics, Incorporated in the preparation of this booklet.

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# 1. INTRODUCTION

## 1.1 Purpose

The purpose of this booklet is to provide guidance to U.S. Department of Energy (DOE) field managers on the management of polychlorinated biphenyl (PCB) waste.

## 1.2 Scope

This booklet focuses on the Toxic Substances Control Act (TSCA) regulations governing the storage and disposal of PCB waste.

First, it emphasizes the revisions to those regulations brought about by the PCB Disposal Amendments Rule (63 FR 35384 of June 29, 1998). Second, it emphasizes those issues of primary concern to DOE, as determined by the majority of comments made during the rulemaking. Thus, issues such as PCB remediation waste, PCB bulk product waste, and PCB/radioactive waste receive attention. On the other hand, issues that received few or no comments, such as dredged materials, PCB household waste, and natural gas pipelines, are omitted.

In addition, this guidance booklet does not discuss the burning of waste oil containing PCBs for energy recovery.

## 1.3 Background

PCBs are compounds that are a subset of synthetic organic chemicals known as chlorinated hydrocarbons. There are 209 PCB isomers and compounds (cogeners), which range from oily liquids to crystalline solids and hard resins. PCBs have unique properties that include non-flammability, chemical stability, low electrical conductance, and high lipophilicity. A mix of these various properties have historically made PCBs suitable for use as dielectric fluids, heat transfer fluids, hydraulic fluids, oils, solvents, paints, coatings, and carbonless copy paper. PCBs are also found as impurities in manufacturing byproducts and in materials on which they are spilled, such as sludges, slurries, and

sediments. About 130 PCB cogeners are found in the environment.

PCBs and PCB waste are subject to the Toxic Substances Control Act and regulations (40 CFR Part 761) implemented by the U.S. Environmental Protection Agency (EPA). This guidance booklet focuses on PCB waste, and the part of the regulations that addresses PCB waste pertaining to storage and disposal requirements.

## 1.4 Definition of PCB Waste

PCB waste is defined at 40 CFR 761.3 as those PCBs and PCB Items (see glossary) that are subject to the disposal requirements found at Subpart D, "Storage and Disposal," of 40 CFR Part 761. The PCBs and PCB Items that are subject to the disposal requirements are those that are:

- No longer in use (see text box below),
- No longer fit for service,
- No longer may or can be serviced (see separate text box below), or
- In storage not having an authorized use.

### Example of Disposal Constituting "Use"

In a disposal provision [40 CFR 762.62(d)], EPA authorizes certain PCB bulk product waste (e.g., automobile shredder waste) as landfill cover or roadbed material.

In addition, unless PCBs or PCB Items are specifically stored for an identified use or reuse, they are considered to be PCB waste.

Because spilled and other uncontrolled discharges of PCBs at concentrations of  $\geq 50$  ppm constitute disposal [40 CFR 761.50(a)(4)], the materials on

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which PCBs are spilled (e.g., soil, concrete, and debris) are also considered to be PCB waste.

Certain items that become contaminated with PCBs can be regarded as PCB waste because they are prohibited from further use. These items include certain solvents, equipment, tools, machinery, vehicles, and containers in good condition. By being decontaminated, EPA allows for these materials to be used or returned to use (reuse). Because such items are not intended for discard or disposal as waste, they will not be discussed here.

**Example of a PCB Item that may no longer be serviced and must be disposed**

40 CFR 761.30(a)(2)(ii) prohibits the servicing or rebuilding of any PCB Transformer that requires the removal of the transformer coil from the transformer casing. Therefore, the only alternative left is disposal of the PCB Transformer.

Decontamination will be discussed only if incidentally mentioned as an option or treatment that is a prerequisite to a disposal requirement (e.g., liquid PCB remediation waste may be decontaminated as well as incinerated).

## 1.5 Characterization of PCB Waste

In order to apply the PCB regulations to PCB waste, you must first characterize the PCB waste as follows:

- Date on which PCBs first became waste,
- Concentration of PCBs, and
- Type of waste (see Chapter 2).

### 1.5.1 Date on which PCBs First Became Waste

The date on which PCBs became waste [date of removal from service] is needed in order to comply with storage requirements, especially the one-year

storage limit (discussed in Chapter 3). A notation or record of this date must be made on the PCB Container or PCB Item. (PCB Container and PCB Item are discussed in Chapter 2.)

If the PCB waste, such as contaminated environmental media, is from a PCB spill or release, the date of the spill or release (see Exhibit 2-5) is needed to determine whether a spill or release is subject to cleanup as PCB remediation waste (see Section 2.3).

### 1.5.2 Concentration of PCBs

PCB waste is generally regulated for disposal under TSCA at concentrations of 50 parts per million (ppm) of PCBs or more. Many of the sections within the regulations require ascertaining the specific concentrations of PCBs prior to disposal or cleaning up a contaminated area to a particular concentration level.

Use the nameplate, label, or manufacturer's specifications on a PCB Article (see Section 2.2.1) to ascertain the PCB concentration. If this information is not available, then you may make certain assumptions (see 40 CFR 761.2) about the PCB concentrations in certain electrical equipment (e.g., transformers) until you are able or required to sample and analyze for PCBs. Note that these assumptions do not apply to disposal (63 FR 35389). Near the time of actual disposal, you must determine the actual PCB concentration in order to use the proper disposal method. However, because some PCB Articles (especially capacitors) are not amenable to servicing or sampling of the PCBs, you may use the assumptions made in accordance with 40 CFR 761.2(a)(4) for disposal.

You may assume non-liquid PCBs (i.e., no free-flowing liquids present) to be \$500 ppm or 100 Fg/100 cm<sup>2</sup> in lieu of sampling and analysis for the purposes of disposal [40 CFR 761.50(a)(5)].

You must determine the concentration of PCBs in contaminated media resulting from a spill or release when cleaning up under 40 CFR 761 Subpart G, "PCB Spill Cleanup Policy," in order to proceed.

The determinations of PCB concentrations must be made on a wet weight or weight/volume basis for liquids and on a dry weight basis for non-liquids (see Section 2.1).

Where disposal or cleanup is required by the regulations, neither disposal nor cleanup may be avoided through dilution (see text box below for Anti-Dilution Rule).

#### Anti-Dilution Rule

40 CFR 761.1(b)(5) states, “No person may avoid any provision specifying a PCB concentration by diluting the PCBs, unless otherwise specifically provided.”

## 1.6 PCB Waste Containing Other Hazardous Constituents

PCB waste may contain other regulated constituents; these may be (1) Resource Conservation and Recovery Act (RCRA) hazardous constituents, (2) radioactive constituents, or (3) a mixture of RCRA and radioactive constituents.

### 1.6.1 Presence of RCRA Hazardous Waste

Occasionally, a PCB waste is found mixed with a RCRA hazardous waste. A RCRA hazardous waste is a waste that:

- Is listed or identified as hazardous in Subpart D of 40 CFR Part 261, or
- Exhibits a hazardous characteristic specified in Subpart C of 40 CFR Part 261 (ignitability, corrosivity, reactivity, or toxicity).

An example of a PCB waste mixed with a RCRA hazardous waste is the rinsate from flushing a PCB Transformer with an F-listed solvent (e.g., tetrachloroethylene) (see 40 CFR 261.31). For more information on RCRA hazardous wastes, refer to the following EH-413 guidance: “Definitions of Solid and Hazardous Waste,” (Automated Guidance) April 1997; “Overview of the Identification of Hazardous Waste Under RCRA,”

DOE/EH-231-007/1291; or “Identification of Certain RCRA Wastes – The F-Spent Solvent, P, and U Listings,” DOE/EH-231-008/1291.

If a PCB waste also contains a RCRA hazardous waste, the waste mixture must be managed in compliance with the applicable regulations of both TSCA and RCRA. 40 CFR 761.1(e) provides that TSCA does not preempt more stringent statutes and regulations. Neither do the other statutes and regulations preempt TSCA.

### 1.6.2 Presence of Radioactive Constituents

PCB waste that is mixed with radioactive constituents is designated as PCB/radioactive waste. The origin of the radioactive constituent can be any of the following:

- Accelerator-produced radioactive material,
- Naturally-occurring radioactive material,
- By-product material,
- Source material, or
- Special nuclear material.

If the radioactive component is either by-product, source, or special nuclear material, the PCB/radioactive waste is also subject to the requirements of the Atomic Energy Act (AEA) in addition to TSCA.

For more information on AEA requirements, refer to “Joint EPA/NRC Guidance on the Definition of Commercial Mixed Low-Level Radioactive and Hazardous Waste” (EPA Office of Solid Waste and Emergency Response Directive No. 9432-00-2) or “Radioactive Waste Processing and Disposal” (NUREG-0634).

Regardless of the source of the radioactive component, DOE Orders 5400.5, “Radiation Protection of the Public and the Environment,” and

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5820.2A, “Radioactive Waste Management,” apply to PCB/radioactive waste.

If the PCB/radioactive waste is mixed with RCRA hazardous waste, the entire mixture is subject to AEA, RCRA, and TSCA. In the event that two or more statutes apply, the most stringent one prevails [40 CFR 761.1(e)]. For example, while TSCA does not regulate the disposal of PCB/radioactive waste containing < 50 ppm of PCBs, the waste is still subject to the requirements for disposal of the radioactive component of the waste.

Because certain special provisions and exceptions apply to PCB/radioactive waste, this type of waste is discussed in Section 2.7.

## 2. TYPES OF PCB WASTE

PCB waste was defined in Section 1.4. This chapter provides a breakdown of the different types of PCB waste consistent with the TSCA definitions given at 40 CFR 761.3, unless otherwise noted. The types of waste described are limited to those predominantly found at DOE sites. It is important to properly categorize PCB waste because the type of waste determines which regulations apply.

### 2.1 Forms of PCBs

Many of the regulations for PCB waste apply specifically to one of its physical forms. Although the forms of PCBs may be divided into liquids, non-liquids, and multi-phasic mixtures, the most important distinction is whether or not a PCB waste contains liquid PCBs.

For example, the regulatory definition of PCB bulk product waste excludes liquid PCBs. Although Exhibit 2-1 shows four types of waste containing both liquids and non-liquids, the storage and disposal requirements for disposal of liquids are separate from those for non-liquids within a type of waste.

Non-liquid PCBs pose less of a risk to health and the environment because they do not disperse, migrate, or enter the exposure pathway as easily as liquid PCBs. PCB waste may come from a manufactured item or material or from contamination of an item or material (see Exhibit 2-2).

#### 2.1.1 Liquid PCBs

Liquid PCBs are homogenous materials that flow as a liquid, containing no more than 0.5 percent PCBs by weight as non-dissolved material. Note that when any liquid PCBs contain more than 0.5 percent by weight of non-dissolved material, it needs to be analyzed as a multi-phasic, non-liquid/liquid mixture (i.e., as a combination of liquid and non-liquid forms) (see Section 2.1.3 below).

Concentrations of liquid PCBs are determined on a wet weight basis or weight/volume (if density is given) basis.

#### 2.1.2 Non-Liquid PCBs

Non-liquid PCBs are materials containing PCBs that, by visual inspection, do not flow at a room temperature of 25°C (77°F), or from which no liquid passes when a 100-g or 100-ml representative sample is placed in a mesh number 60 ± 5 percent paint filter and allowed to drain at room temperature for 5 minutes. For materials such as sludges or sediments potentially containing free liquids, use this paint filter test to determine the presence of free liquids.

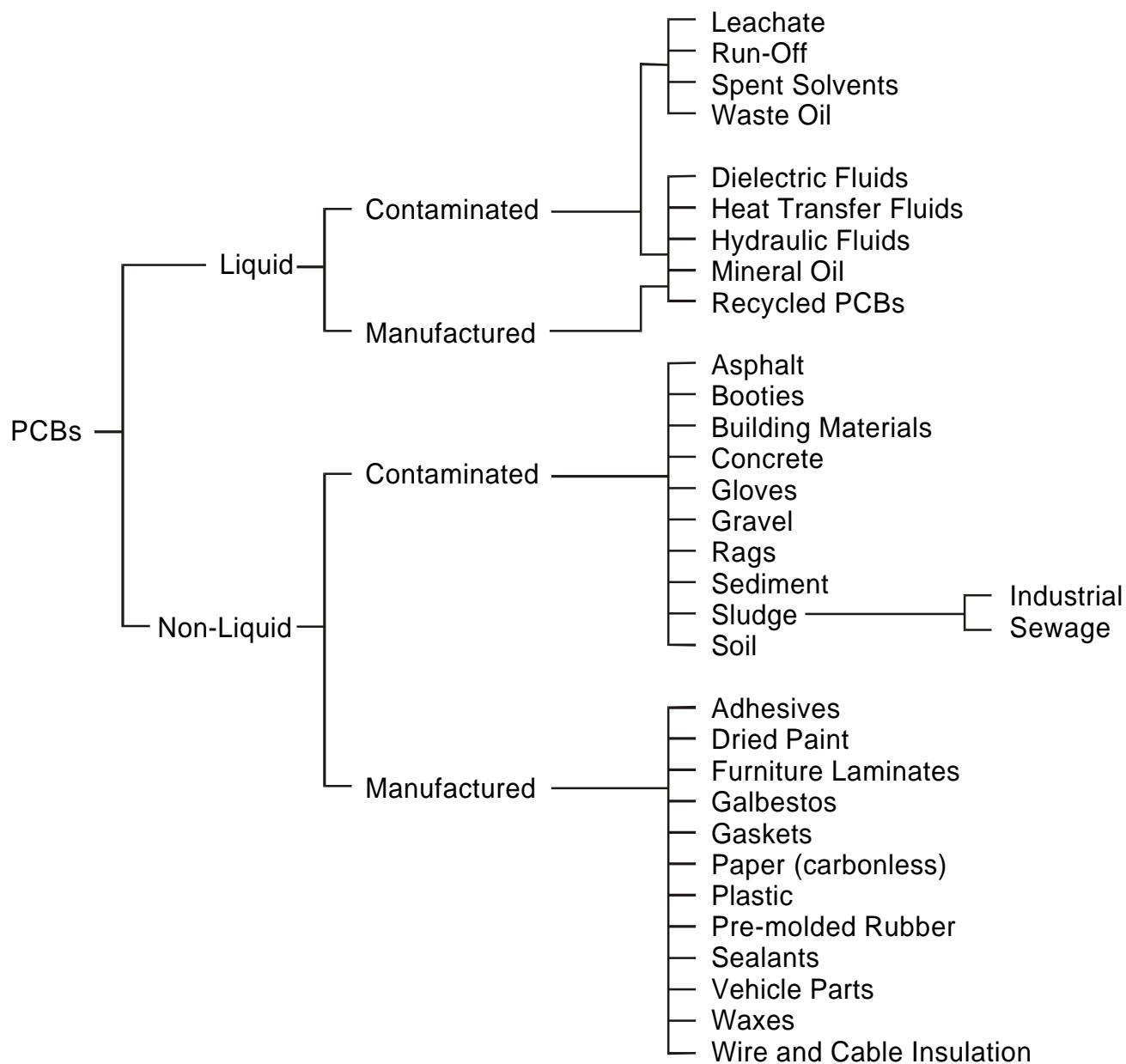
Concentrations of non-liquid PCBs are determined on a dry weight basis per 40 CFR 761.1(b)(4).

**Exhibit 2-1. Forms of PCBs Found in Waste**

Type of Waste	Liquid PCBs	Non-Liquid PCBs
PCB Articles	X	(see § 2.2.1)
PCB Remediation Waste	X	X
PCB Bulk Product Waste		X
PCB/Radioactive Waste	X	X
Waste from Research and Development Activities	X	X
Decontamination Waste and Residue	X	X



**Exhibit 2-2. Examples of Liquid and Non-Liquid PCBs**



### 2.1.3 Multi-Phasic Mixtures

If the PCBs are multi-phasic mixtures (i.e., both non-liquid and liquid PCBs), you may separate the phases and perform the appropriate analysis on each phase. If disposing of non-separated or non-separable multi-phasic PCB waste, use the PCB storage or disposal requirements that apply to the phase with the highest PCB concentration, unless otherwise specified.

## 2.2 PCB Items

PCB Items (see Exhibit 2-3) may be any one of the following four types: PCB Article, PCB Container, PCB Article Container, or PCB Equipment, that deliberately or unintentionally contains PCBs.

All the general requirements that apply to PCB Items also apply to these four sub-types of items. For example, a requirement that a PCB Item stored for disposal must be dated would also apply to a PCB Article Container.

Thus, a general requirement that applies to PCB liquids would apply to a PCB liquid drained from a PCB Item.

### 2.2.1 PCB Article

PCB Article means any manufactured article, other than a PCB Container, that contains PCBs and whose surface(s) has been in direct contact with PCBs. PCB Articles include transformers, capacitors, hydraulic machines, electric motors, pumps, pipes, and any other manufactured item which has:

- C Been formed to a specific shape or design during manufacture,
- C End use function(s) dependent, in part or whole, upon its shape or design during end use, and
- C Undergone no change of chemical composition during its end use or only those

changes with no commercial purpose aside from that of the PCB Article.

Certain types of PCB Articles in Exhibit 2-3 are described in more detail below, including PCB Transformer, Capacitor, and PCB-Contaminated Electrical Equipment. A general requirement that applies to PCB Items and PCB Articles would also apply to all of these items.

PCBs found in PCB Articles are almost always in liquid form except for some equipment filled with an epoxy or tar-like potting compound that contains PCBs (e.g., a “dry” potential transformer).

#### 2.2.1.1 Transformer

PCB Transformer means any transformer that contains \$500 ppm PCBs in the dielectric fluid. PCB-Contaminated Transformer means a transformer containing a concentration of PCBs in the range of \$50 ppm and < 500 ppm PCBs. PCB-Contaminated Transformer is a subset of PCB-Contaminated Electrical Equipment (Section 2.2.1.3).

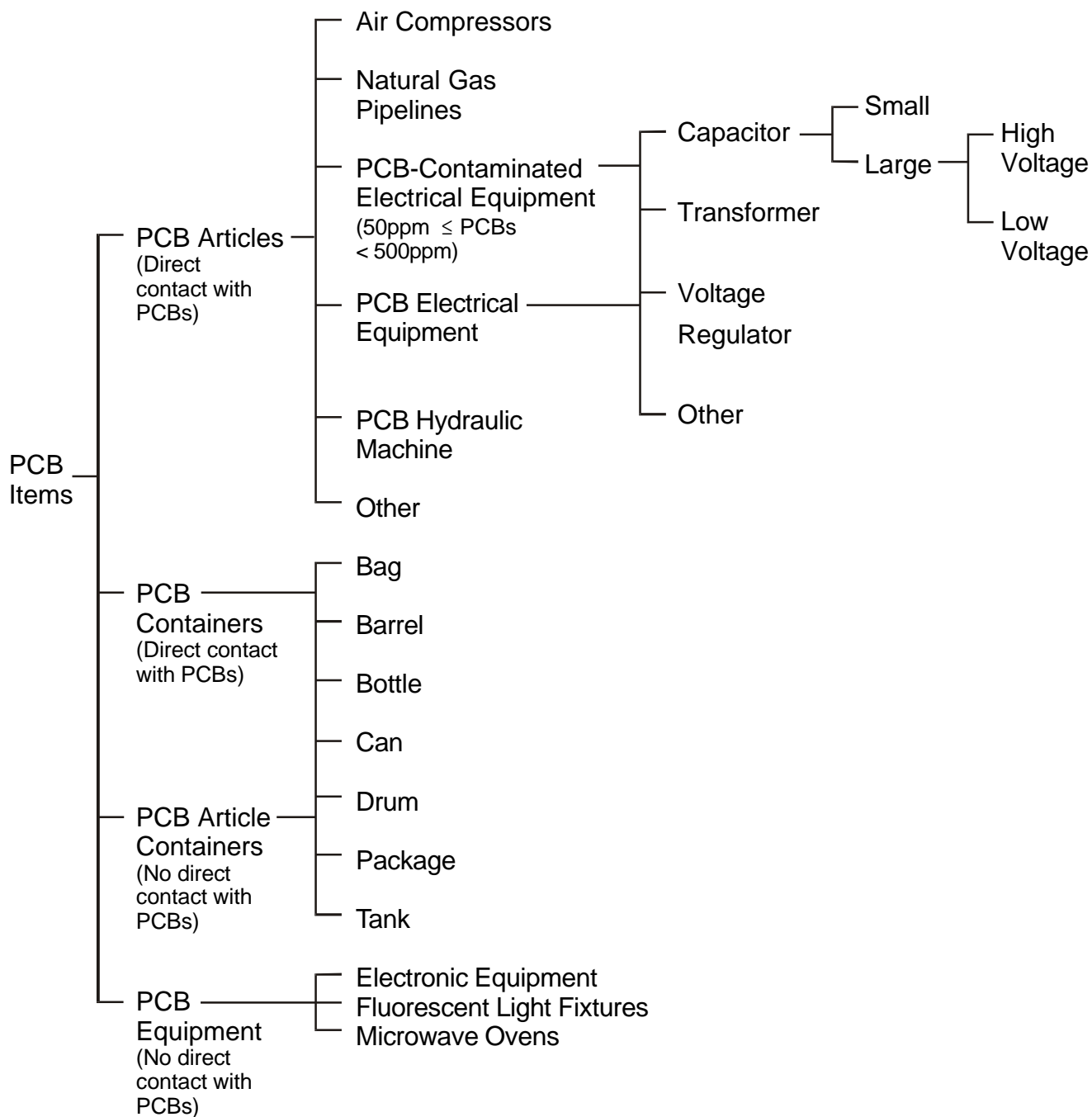
#### 2.2.1.2 Capacitor

Capacitor means a device for accumulating and holding an electrical charge and consists of conducting surfaces separated by a dielectric. The PCB concentration and size of the capacitor determine which regulations apply.

The provisions at 40 CFR 761.2(a)(4) specify the following assumptions about PCB concentration if the PCB concentration has not been tested or documentation from the manufacturer is lacking:

- C You must assume PCBs \$500 ppm in a capacitor of unknown concentration made prior to July 2, 1979, or whose date of manufacture and concentration are unknown.

**Exhibit 2-3. Hierarchy of PCB Items**



- C You may assume PCBs < 50 ppm in a capacitor made after July 2, 1979 (i.e., a non-PCB capacitor).
- C You may assume a capacitor is non-PCB if it is marked “non-PCB” at the time of manufacture.

PCB Capacitor means any capacitor that contains \$500 ppm PCBs. A PCB capacitor, as opposed to a PCB Capacitor, is a capacitor with detectable PCBs.

### Small Capacitor

Small capacitor means a capacitor which contains less than 1.36 kg (3 lbs) of dielectric fluid. If the weight of dielectric fluid is unknown, use Exhibit 2-4 to determine the size of a capacitor.

### Large Capacitor

A large capacitor is a capacitor which contains 1.36 kg (3 lbs) or more of dielectric fluid.

### Large High Voltage Capacitor

Large high voltage capacitor is a Large Capacitor which operates at 2,000 volts (AC or DC) or above.

### Large Low Voltage Capacitor

Large low voltage capacitor means a Large Capacitor which operates below 2,000 volts (AC or DC).

### *2.2.1.3 PCB-Contaminated Electrical Equipment*

PCB-Contaminated Electrical Equipment means any electrical equipment (such as transformers, capacitors, and circuit breakers, including those in railroad locomotives and self-propelled cars) which contain \$ 50 ppm and < 500 ppm PCBs in the dielectric fluid. In the less frequently encountered case of dry electrical equipment, the electrical equipment is PCB-Contaminated if it has PCBs > 10 Fg/100 cm<sup>2</sup> and < 100 Fg/100 cm<sup>2</sup> as measured by a standard wipe test [described in 40 CFR 761.123].

### **2.2.2 PCB Container**

PCB Container means any package, can, bottle, bag, barrel, drum, tank, or other device that contains PCBs or PCB Articles and whose surface(s) has been in direct contact with PCBs.

### **2.2.3 PCB Article Container**

PCB Article Container means any package, can, bottle, bag, barrel, drum, tank, or other device used to contain PCB Articles or PCB Equipment, and whose surface(s) has not been in direct contact with PCBs.

### **2.2.4 PCB Equipment**

PCB Equipment means any manufactured item, other than a PCB Container or PCB Article Container, which contains a PCB Article or other

**Exhibit 2-4. Determining the Size of a Capacitor**

Measured Volume is		Assume Weight of Dielectric Fluid is		Assume Capacitor Is
(cm <sup>3</sup> )	(in <sup>3</sup> )	(kg)	(lbs)	
< 1,639	< 100	< 1.36	< 3	Small
\$ 1,639 and # 3,278	\$ 100 and # 200	< 1.36 if capacitor is < 4.08 kg	< 3 if capacitor is < 9 lbs	Small
		\$1.36 if capacitor is \$ 4.08 kg	\$ 3 if capacitor is \$ 9 lbs	Large
> 3,278	> 200	\$ 1.36	\$ 3	Large

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## 2. Types of PCB Waste

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piece of equipment with PCBs. PCB Equipment includes microwave ovens, electronic equipment, and fluorescent light fixtures.

A PCB Article of common concern in PCB Equipment is the capacitor. If it is an intact and non-leaking small capacitor, the small capacitor does not need to be removed, and the PCB Equipment is not subject to further regulation for storage and disposal (check Section 4.3.1.3 to be sure). PCB Large (Low or High Voltage) Capacitors need to be removed from PCB Equipment if the equipment is to be stored or disposed as an unregulated item.

A type of PCB Equipment of concern is fluorescent light fixtures. Generally, the controlling factor in the storage and disposal of these fixtures is the PCB Small Capacitor. If the small capacitor is intact and non-leaking, the fixture is not subject to further regulation for storage and disposal. If the potting material in the ballast of the fixture contains  $\geq 50$  ppm PCBs, the ballast --not the intact and non-leaking capacitor--becomes the controlling factor in disposal of the fixture, and such ballasts or fixtures (if such ballasts are not removed from the fixtures) are regulated as PCB bulk product waste (see Section 2.4).

However, if the capacitor is not intact or leaking, regardless of the PCB concentration of the potting material, the fluorescent light fixture must be disposed as a PCB liquid (see Section 4.2) whenever the leak is confined to the inside of the fixture, or as a PCB remediation waste (see Section 4.4.2) whenever the leak extends to the outside of the fixture.

Exhibit 2-5 summarizes how a fluorescent light ballast should be disposed that contains both a PCB capacitor and potting material.

### 2.3 PCB Remediation Waste

PCB remediation waste encompasses soil, rags, and other debris generated as a result of any PCB spill not cleaned up under Subpart G but cleaned up under 40 CFR 761.61 (including materials from "old spills" in Exhibit 2-6) or from other unauthorized

disposal. Such waste includes, but is not limited to, those items identified in Exhibit 2-7.

PCB remediation waste may contain either or both liquid and non-liquid PCBs. For purposes of cleaning, decontaminating, or removing PCB remediation waste, there are five general waste categories: bulk PCB remediation waste, non-porous surfaces, porous surfaces, liquid PCB remediation waste, and cleanup waste (see Exhibit 2-7).

#### 2.3.1 Bulk PCB Remediation Waste

Bulk PCB remediation waste includes, but is not limited to, the following non-liquid materials which are contaminated with PCBs: soil, sediments, dredged materials, muds, sewage sludge, and industrial sludge [40 CFR 761.61(a)(4)(i)].

#### 2.3.2 Non-Porous Surface

Non-porous surface means a smooth, unpainted, solid surface that limits penetration of liquid containing PCBs beyond the immediate surface. Some examples are as follows: smooth uncorroded metal, smooth glass, smooth glazed ceramics, impermeable polished building stone (e.g., marble or granite), and high-density plastics (e.g., polycarbonates and melamines) that do not absorb organic solvents.

#### 2.3.3 Porous Surfaces

Unlike non-porous surfaces, porous surfaces do not prevent or minimize penetration of PCBs beyond the immediate surface. Examples are concrete, cement, asphalt, plaster, paint or coating on metal, corroded metal, fibrous glass, glass wool, unglazed ceramics, porous building stone, low-density plastics (e.g., styrofoam, polyethylene), paper, cardboard, and tar paper (see Exhibit 2-7).

#### 2.3.4 Liquid PCB Remediation Waste

Liquid PCB remediation waste [40 CFR 761.61(a)(4)(iv) and (a)(5)(iv)] includes but is not limited to water removed from the dewatering of

## Exhibit 2-5. Disposal of Fluorescent Light Ballasts

PCB Capacitor	PCB Potting Material	Labeling, Transportation and Manifesting for Disposal	Disposal Reference(s)*	Disposal Options
"No PCBs" label		Not regulated under TSCA	—	Not regulated under TSCA
None	< 50 ppm	Not regulated under TSCA	—	Not regulated under TSCA
Intact and non-leaking or none	\$ 50 ppm	It is a PCB Article  If it is placed in a container, the container must be labeled when transported for disposal  It must be manifested  It may be disposed as PCB bulk product waste	.50(b)(2)(ii) .62(a)-(c)	TSCA Incinerator [§761.70]  TSCA/RCRA Landfill [§761.75]  Alternate Destruction Method [§761.60(e)]  Decontamination [§761.79]  State approved landfill (leach test required) [§761.62(b)]  Risk-based approval [§761.62(c)]
Intact and non-leaking	< 50 ppm	No labeling or manifesting required	.50(b)(2)(i)	As municipal solid waste or 40 CFR 761 subpart D options [see Exhibit 4-1]
Leaking	< 50 ppm or \$ 50 ppm	Dispose as PCB liquid or PCB bulk product waste depending on whether the liquids leaked outside of the ballast  Containers must be labeled  Must be manifested	.60(a) .62	TSCA Incinerator [§761.70]  Alternate Destruction Method [§761.60(e)]  Decontamination + State approved landfill

\* Disposal references are to 40 CFR Part 761; §761.65(d) storage approval may be required if > 500 gallons of non-DOE waste is stored.

## 2. Types of PCB Waste

### Exhibit 2-6. Spills Covered by PCB Remediation Waste

Date of PCB Spill	Was Source of Spilled PCBs an Authorized Use?	Existing PCB Concentration	PCB Concentration of Source
before 04/18/1978	yes	\$ 50 ppm	any
on or after 04/18/1978 and before 07/02/1979	yes	any	\$ 500 ppm
on or after 07/02/1979	yes	any	\$ 50 ppm
any	no	any	any

Note: When complete information cannot be obtained to use the table to determine whether a spill is subject to cleanup as PCB remediation waste, assume that the material from the spill or release is subject to cleanup as PCB remediation waste. Source: 63 [FR](#) 35438

bulk PCB remediation waste, aqueous decantate from sediment, leachate collected from on-site storage of bulk PCB remediation waste, and run-off from fire suppression involving PCBs.

#### 2.3.5 Cleanup Wastes

Cleanup wastes [40 CFR 761.61(a)(5)(v)] include non-liquid cleaning materials and personal protective equipment waste at any concentration. Examples are rags, gloves, booties, and other disposable items. Cleaning solvents, abrasives, and equipment used in cleanup constitute a subcategory of cleanup wastes.

#### 2.4 PCB Bulk Product Waste

PCB bulk product waste is \$50 ppm PCB waste derived from manufactured products containing non-liquid PCBs (see Section 2.1.2 for the definition of non-liquid PCBs). PCB bulk product waste excludes PCB Items, PCB remediation waste, PCB household waste [40 CFR 761.63], and wastes from research and development activities (see Section 2.6).

Examples of PCB bulk product waste (see Exhibit 2-8) include but are not limited to:

- C Non-liquid bulk waste or debris from building demolition that contains PCBs. (PCB bulk product waste excludes debris from the

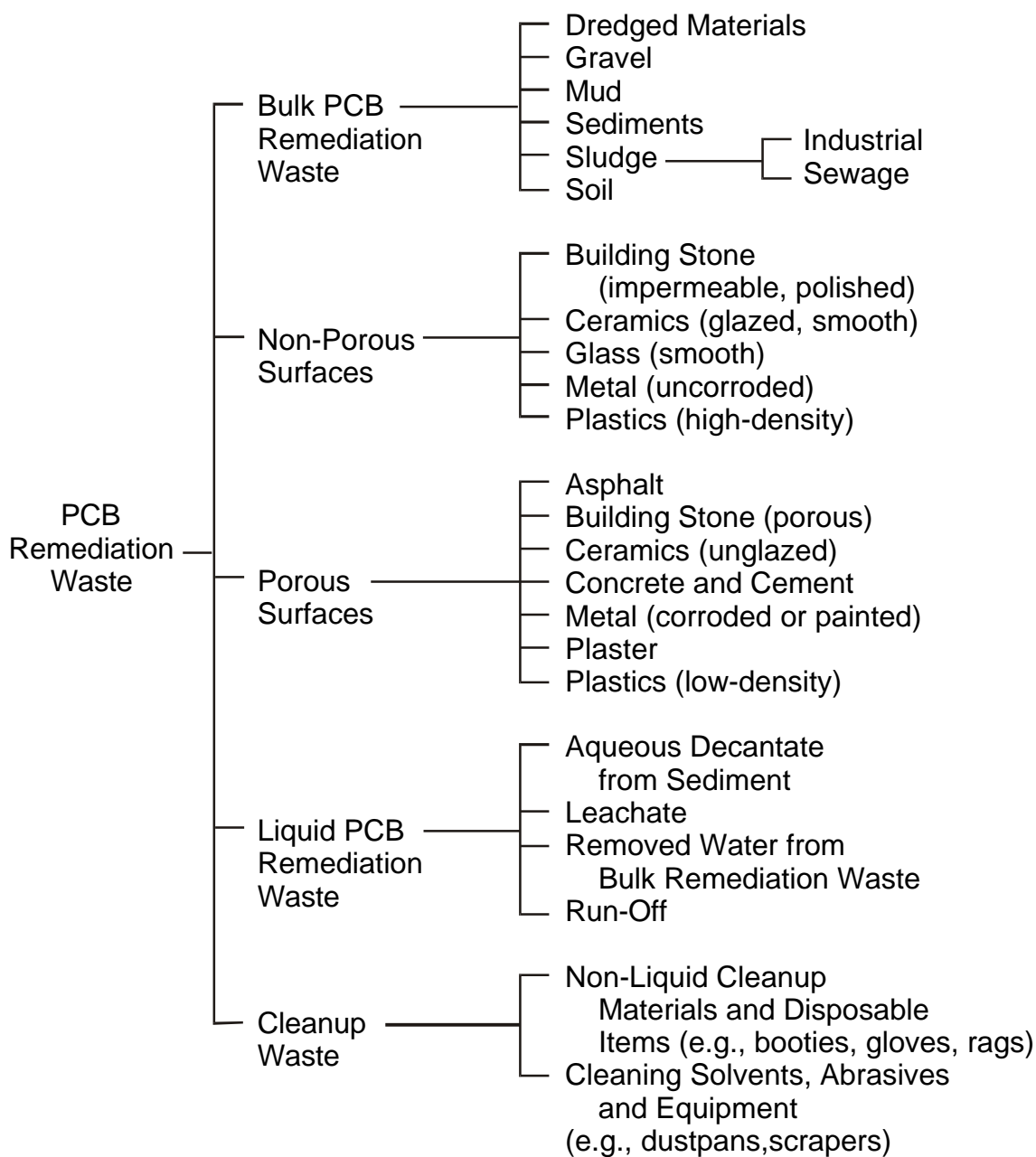
demolition of buildings or other man-made structures from which spilled PCBs have not been removed);

- C Fluorescent light ballasts containing PCBs in the potting material;
- C PCB-containing wastes from the shredding of automobiles and appliances (shredder fluff); and
- C Plastics, preformed or molded rubber parts, applied dried paints, sealants, caulking, adhesives, paper, Galbestos, noise insulation, and felt or fabric products such as gaskets from air-handling system gaskets.

#### 2.5 PCB/Radioactive Waste

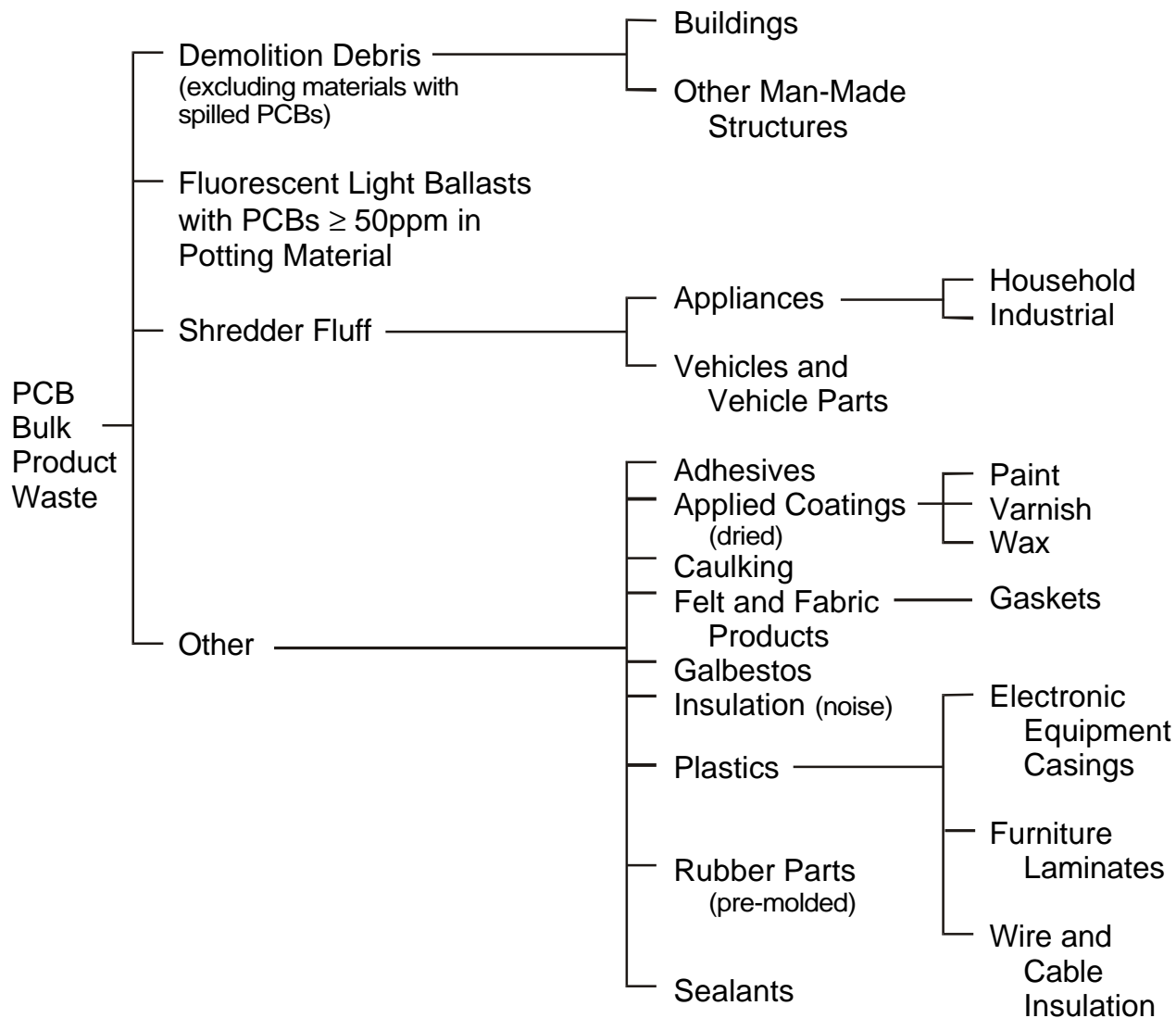
PCB/radioactive waste is a PCB waste that also contains a radioactive constituent (see Section 1.6.2) and is not mutually exclusive of the other types of waste. For example, a PCB remediation waste can also be a PCB/radioactive waste. Furthermore, any of the other types of waste to be discussed (waste from research and development activities and decontamination waste and residue) can also be a PCB/radioactive waste. If a PCB waste is also a PCB/radioactive waste, the storage and disposal regulatory provisions for PCB/radioactive waste apply as well as those for the other waste type.

## Exhibit 2-7. PCB Remediation Waste





### Exhibit 2-8. PCB Bulk Product Waste



## **2.6 Waste from Research and Development Activities**

This type of waste [40 CFR 761.64] consists of waste from authorized research and development activities [40 CFR 761.30(j)] including, but not limited, to the following:

- Ⓒ Chemical analysis of PCBs (sample preparation, extraction, extract cleanup, extract concentration, addition of PCB standards, and instrumental analysis), and analyses to determine PCB concentration;
- Ⓒ Determinations of the physical properties of PCBs;
- Ⓒ Studies of PCB environmental transport processes; and
- Ⓒ Studies of PCB biochemical transport processes, studies of effects of PCBs on the environment, and studies of the health effects of PCBs (direct toxicity and toxicity of metabolic products of PCBs).

Authorized research and development activities do not include research, development, or analysis for the development of any PCB product. Waste from research and development activities does not include waste from activities conducted for the purposes of research and development into PCB disposal described in 40 CFR 761.60 (j) [see Section 4.9].

Waste from research and development activities can be liquid and/or non-liquid PCBs.

chopping, shredding, scraping, abrading or oil /water separation, as opposed to solvent rinsing and soaking);

- Ⓒ Solvents used or reused for decontamination; and
- Ⓒ Non-liquid cleaning materials and personal protective equipment waste, non-porous surfaces, rags, gloves, booties, other disposable materials or items.

Decontamination waste and residue can be liquid and/or non-liquid PCBs.

## **2.7 Decontamination Waste and Residue**

Examples of this type of waste [40 CFR 761.79(g)] include:

- Ⓒ Distillation bottoms or residues and filter media;
- Ⓒ PCBs physically separated from regulated waste during decontamination (such as by

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## 3. STORAGE OF PCB WASTE

The storage of PCB waste is divided into the following areas: general requirements and specific requirements. Specific requirements cover bulk PCB liquids, PCB Articles, PCB remediation waste, PCB bulk product waste, and PCB/radioactive waste.

### 3.1 General Requirements

The discussion of general requirements for storing PCB waste begins with the one-year storage limit. This limit is critical because it is not always possible to secure disposal within this time limit.

The description of the one-year limit is followed by discussion of the other general requirements. These pertain to extensions to the one-year limit, temporary storage, general storage units, alternate storage units, waste containers, checking for leaks, dating, marking, and removal of equipment.

#### 3.1.1 One-Year Storage Limit

EPA distinguishes between storage of PCBs and PCB Items for reuse, and storage of PCBs and PCB Items for disposal. PCBs and PCB Items stored for disposal -- otherwise known as PCB waste -- are subject to a one-year limit from the date of removal from service. You must dispose PCB waste within one-year [40 CFR 761.65(a)(1)]. A special exception to this limit is granted for PCB/radioactive waste (see Section 3.6.1).

#### 3.1.2 Extensions to the One-Year Limit

You may obtain an extension to the one-year storage limit by sending a written notification to the EPA Regional Administrator (for the Region where the wastes are stored) providing information about your:

- Identity;
- Types, volumes, and locations of the PCB waste; and

- Reasons for the inability to dispose or secure disposal of the PCB waste.

The EPA Regional Administrator will grant an extension of one additional year for storage of the waste upon receipt of the notification if all of the following conditions are met [40 CFR 761.65(a)(2)]:

- EPA receives the notification at least 30 days before the initial one-year limit expires;
- Written records are maintained documenting all continuing attempts to secure disposal (until the waste is disposed);
- Written records (described previously) are made available to EPA upon request; and
- Continuing attempts to secure disposal were initiated within 270 days after the time the waste was first subject to the one-year limit.

Failure to initiate and continue attempts to secure disposal throughout the entire time the waste is stored automatically disqualifies eligibility for the extension.

You may also request additional extensions [40 CFR 761.65(a)(3) and (a)(4)] beyond the one-year extension to the one-year storage limit. Submit a written request to the EPA Regional Administrator (for the region where the waste is stored) or the Director, National Program Chemicals Division (if the waste is stored in more than one region). You must supply:

- Justification for the request, and
- Information about what measures are being taken to secure disposal of the waste or why disposal could not be conducted during the period of the prior extension.

As a condition of granting any extension, EPA may require specific actions such as marking, inspection,

### 3. Storage of PCB Waste

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recordkeeping, periodic reporting, or financial assurance to ensure that the waste does not pose an unreasonable risk of injury to health or the environment. In deciding whether to grant an extension, EPA will consider whether relevant treatment or disposal options are being pursued, additional storage time poses an unreasonable risk of injury, there is an absence of approved treatment technology, or additional time is needed to complete treatment or destruction process.

#### 3.1.3 Temporary Storage

EPA allows temporary storage of PCB wastes in units whose specifications [40 CFR 761.65(c)(1)] are less stringent than those for general storage units or alternate storage units described in Sections 3.1.4 and 3.1.5, respectively. Temporary storage must meet two conditions:

- Storage of no longer than 30 days from the date of removal from service, and
- Notation of the date of removal from service attached to the PCB Container or PCB Item stored for disposal.

You may place the following PCB Items into temporary storage:

- Liquids with PCBs  $\leq$  50 ppm in a U.S. Department of Transportation specified container (see Section 3.1.6) and under a Spill Prevention Control and Countermeasures Plan [40 CFR Part 112] for the area;
- PCB Containers with non-liquid PCBs, such as contaminated soil, rags, and debris;
- Non-leaking PCB Articles and PCB Equipment; and/or
- Leaking PCB Articles and PCB Equipment if
  - Placed into non-leaking PCB Containers, and

- Sufficient sorbent materials are inserted to absorb any remaining PCB liquids.

#### 3.1.4 General Storage Units

Units for storing PCB waste beyond 30 days must meet all of the following criteria [40 CFR 761.65(b)(1)(i) to (b)(1)(v)]:

- Adequate roof and walls to prevent rain from reaching the PCB waste;
- Adequate floor with 6-inch high, continuous curbing. (a special exception is provided for PCB/radioactive waste; see Section 3.6.2);
- Floor and curbing providing a containment volume equal to the greater of
  - Two times the internal volume of the largest PCB Article or PCB Container, or
  - 25% of the total internal volume of all PCB Articles or PCB Containers stored;
- No drain valves, floor drains, expansion joints, sewer lines, or other openings that would permit liquids to flow from the curbed area;
- Floors and curbing constructed of Portland cement, concrete, or a continuous, smooth, non-porous surface (see index), which prevents or minimizes penetration of PCBs; and
- On a site above the 100-year floodplain.

Exceptions to the criteria for storage unit requirements are discussed in Section 3.1.3, “Temporary Storage,” Section 3.1.5, “Alternate Storage Units,” Section 3.3.1.1, “PCB Large High Voltage Capacitors and PCB-Contaminated Electrical Equipment,” Section 3.4, “PCB Remediation Waste,” Section 3.5, “PCB Bulk Product Waste,” and Section 3.6, “PCB/radioactive

Waste.” In addition, you may store PCB waste at a commercial storage facility [see 40 CFR 761.65(d)].

#### **A Best Management Practice**

**Avoid** storage of PCB waste at or near a location that poses an exposure risk to food or feed, as a best management practice.

Note that any spills of PCBs stored in any RCRA unit (the first three listed units) must be cleaned up in accordance with Subpart G, “PCB Spill Cleanup Policy” (40 CFR 761.120 to 761.135).

RCRA facilities used for storing PCB waste follow the RCRA containment requirement and not the TSCA containment requirement. The RCRA containment requirement is 10% of the volume of all containers or the volume of the largest container, whichever is larger.

#### **3.1.5 Alternate Storage Units**

In addition to the units meeting the criteria listed in Section 3.1.4, PCB waste may be stored beyond 30 days in alternate storage units. They may be any one of the following units [40 CFR 761.65(b)(2)]:

- Permitted by EPA under RCRA Section 3004 for managing hazardous waste in containers;
- Permitted by a state authorized under RCRA Section 3006 for managing hazardous waste in containers;
- Qualified for interim status under RCRA Section 3005 for managing hazardous waste in containers and meets the containment requirements [40 CFR 264.175];
- Approved, or otherwise regulated, under a State PCB waste management program no less stringent in the protection of health or the environment than the TSCA requirements;
- Subject to a TSCA Coordinated Approval that includes provisions for PCB waste storage; or
- Given a TSCA PCB waste management approval that includes provisions for PCB waste storage, issued under 40 CFR 761.61(c) or 761.62(c).

#### **3.1.6 Containers for PCB Waste**

EPA has adopted the U.S. Department of Transportation's (DOT) container requirements as the container requirements for holding PCB waste. DOT's container requirements are part of the “Hazardous Materials Regulations” (49 CFR Parts 171 - 180). In particular, refer to:

- 49 CFR 173.202 and 173.203 regarding containers for liquid PCBs (also see Section 3.2 for larger than DOT-specified containers), and
- 49 CFR 173.212 and 173.213 regarding containers for non-liquid PCBs.

The EPA regulation governing containers for PCB waste is 40 CFR 761.65(c)(6). EPA has provided exceptions to DOT containers for PCB/radioactive waste (see Section 3.6.3.3).

##### **3.1.6.1 Packing Group**

Bear in mind, in choosing the appropriate container, that PCBs are in Packing Group II (as listed in the Hazardous Materials Table, 49 CFR 172.101). However, PCBs transported by rail or highway need only be packaged in Packing Group III. Notwithstanding, other hazards (e.g., radioactivity) present in the PCB waste may require a more stringent or higher Packing Group.

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### **3. Storage of PCB Waste**

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#### **3.1.6.2 Old DOT Specification Containers**

In adopting the DOT container requirements, EPA is also adopting a particular requirement regarding use of old DOT Specification containers for storage purposes. Transportation of PCBs in the old DOT Specification 5, 5B, 6D, 17C, and 17E containers has been illegal since October 1, 1996, except on a transitional basis [defined in 49 CFR 173.14(a)(2)]. (A special exception has been provided for PCB/radioactive waste; see Section 3.6.3.2.)

#### **3.1.6.3 PCB Waste < 20 ppm or 1 Pound**

Because of the Anti-Dilution Rule and because DOT does not regulate < 20 ppm or < 1 pound of PCBs, EPA may require DOT containers in situations where DOT may not. In fact, EPA requires waste of < 20 ppm of PCBs or < 1 pound of PCBs to be in Packing Group III containers, unless other hazards present in the PCB waste compel a more stringent Packing Group (i.e., a Packing Group I or II) container.

For the purposes of describing PCB waste not subject to DOT regulation but still subject to EPA regulation, on a manifest, use the term, "Non-DOT Regulated PCBs."

#### **3.1.7 Checking for Leaks**

All PCB Items (PCB Articles, PCB Containers, and PCB Article Containers) in storage must be checked for leaks at least once every 30 days [40 CFR 761.65(c)(5)]. In the event of a leak, you should:

- Transfer any leaking PCB Container or PCB Article and the contents to properly marked non-leaking containers;
- Cleanup and dispose any spilled or leaked material per Subpart G, "PCB Spill Cleanup Policy"; and
- Keep records of inspections, maintenance, cleanup, and disposal [40 CFR 761.180(a)(1)(iii) and (b)(1)(iii)].

#### **3.1.8 Dating**

All PCB Containers storing bulk PCB liquid wastes for disposal and PCB Items (PCB Articles and PCB Article Containers) in storage for disposal must be dated. For bulk PCB liquid wastes, a record of the following information must be maintained that tracks each batch added or removed from the container:

- Date added or removed,
- Quantity added or removed, and
- Disposition of the batch (only for a removed batch).

PCB Items (including PCB Article Containers and PCB Articles) must be marked with the date on which they were removed from service for disposal. The storage of PCB Items must be managed in such a way that a PCB Item can be located by date.

See also record retention requirements at 40 CFR 761.180(a) and (b). Dating and management of stored PCB Containers and PCB Items by date are required by 40 CFR 761.65(c)(8).

#### **3.1.9 Marking**

All storage areas [including temporary storage areas (Section 3.1.3), general storage areas (Section 3.1.4), and alternate storage units (Section 3.1.5)] must be marked [40 CFR 761.40(a)(10) and 40 CFR 761.65(c)(3)].

#### **3.1.10 Removal of Equipment**

If movable equipment (e.g., forklifts) came into direct contact with PCBs while handling PCB waste in a storage area [including temporary storage areas (Section 3.1.3), general storage areas (Section 3.1.4), and alternate storage units (Section 3.1.5)], they must be decontaminated per 40 CFR 761.79(c)(2) before being removed from the storage area. Decontamination is required by 40 CFR 761.65(c)(4).

### **3.2 PCB Liquid Waste**

A special provision modifies the application of the general storage requirements to PCB liquid waste. It allows the use of larger containers than those discussed in Section 3.1.6.

Larger storage containers may be necessary to facilitate consolidation of batches of PCB liquid wastes. Such containers may include rolling stock, such as tanker trucks authorized per 49 CFR Parts 171 - 180. When larger containers are stationary (i.e., not intended for transport), non-DOT containers may be used [40 CFR 761.65(c)(7)] provided:

- They comply with Occupational Safety and Health Standards (29 CFR 1910.106), "Flammable and Combustible Liquids." Note that the larger containers must be strong enough to hold liquids of high specific-gravity, that are representative of PCBs.
- A Spill Prevention Control and Countermeasure (SPCC) Plan is in effect for the area where the larger containers are stored:
  - "Oil" is to be read as "PCBs" wherever it appears in 40 CFR Part 112, which specifies the SPCC requirements.
- Unless some fraction of the liquid waste stored in the larger containers is oil as defined in the Clean Water Act Section 311, the following do not apply to the SPCC Plan:
  - Exemptions for storage capacity at 40 CFR 112.1(d)(2), and
  - Amendment of SPCC Plan by the EPA Regional Administration per 40 CFR 112.4.

### **3.3 PCB Items**

This Section discusses special provisions for the different types of PCB Items, which include PCB Articles, PCB Containers, and PCB Article

Containers.

#### **3.3.1 PCB Articles**

Special exceptions from the general requirements (described in Section 3.1) are provided for PCB Large High Voltage Capacitors and PCB-Contaminated Electrical Equipment.

##### *3.3.1.1 Undrained PCB Large High Voltage Capacitors and PCB-Contaminated Electrical Equipment*

EPA allows storage for disposal of undrained (1) PCB Large High Voltage Capacitors and (2) PCB-Contaminated Electrical Equipment in units not meeting the criteria listed in Sections 3.1.4 or 3.1.5 if all of the following conditions [40 CFR 761.65(c)(2)] are met:

- Such PCB Articles are non-leaking and structurally undamaged;
- Such PCB Articles are placed on pallets next to a storage unit meeting the criteria given in Sections 3.1.4 and 3.1.5 [which summarize the requirements of 40 CFR 761.65(b)(1) and (b)(2), respectively]; and
- Such PCB Articles are placed on pallets next to a storage unit meeting the criteria given in Sections 3.1.4 and 3.1.5 [which summarize the requirements of 40 CFR 761.65(b)(1) and (b)(2), respectively]; and
- Such PCB Articles are checked for leaks weekly; and
- The storage unit has immediately available unfilled storage space equal to 10% of the volume of capacitors and equipment stored outside the unit.

The area where the pallets of undrained (1) PCB Large High Voltage Capacitors and (2) PCB Contaminated Electrical Equipment are stored does not have to be marked but the adjoining storage unit



### 3. Storage of PCB Waste

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has to be marked as required in 40 CFR 761.40(a)(10).

#### **DOE Still Phasing Out Large Capacitors**

Because the original phaseout date of October 1, 1988, for most uses of PCB Large High Voltage Capacitors had passed, EPA proposed to delete the provision allowing pallet storage of these articles during the PCB Disposal Amendments rulemaking. However, DOE EH-413 commented that the Oak Ridge K-25, Portsmouth, and Paducah sites have over 9,000 PCB Large High Voltage Capacitors that are in the process of being phased out (under a Federal Facilities Compliance Agreement). Needless to say, deleting the provision for pallet storage prior to disposal would have created undue hardship. At this time Paducah has already completed removal of its capacitors.

#### **3.3.1.2 Drained PCB-Contaminated Electrical Equipment**

PCB-Contaminated Electrical Equipment drained of all free-flowing dielectric fluid is not subject to any of the requirements for the storage for disposal of PCBs (40 CFR 761.65). The reference for this provision is 40 CFR 761.60(b)(6)(ii)(B) and 761.65(c)(2).

#### **3.3.2 PCB Containers**

Requirements for containers with PCB liquids have already been covered in Sections 3.1 to 3.2. Empty, unrinsed containers that came into direct contact with PCB liquids should be stored the same way as containers with PCB liquids. Empty, decontaminated, or uncontaminated PCB Containers are not regulated for storage.

#### **3.3.3 PCB Article Containers**

Prior to the PCB Disposal Amendments Rule, 40 CFR 765.65(c)(5) and (c)(8) inadvertently omitted “PCB Article Containers” as being subject to the requirements of checking for leaks (see Section 3.1.7) and dating (see Section 3.1.8). EPA rectified this loophole by requiring PCB Items (which by definition includes PCB Articles, PCB Article Containers, and PCB Containers) to be checked for leaks and dated.

PCB Article Containers that come into direct contact with PCBs (because of a leaking PCB Article within the PCB Article Container) should be handled the same way as containers with PCB liquids (see Section 3.2) because they become PCB Containers by definition [see 40 CFR 761.3]. Empty, decontaminated, or uncontaminated PCB Article Containers are unregulated for storage.

### **3.4 PCB Remediation Waste**

If PCB remediation waste is stored for 30 days or less, it may be placed in temporary storage (see Section 3.1.3). For more than 30 days, there is an alternative to storing this waste in a general storage or alternate storage unit (see Section 3.1.4 or 3.1.5). In the PCB Disposal Amendments Rule, EPA added 40 CFR 761.65(c)(9) to provide for on-site storage of bulk PCB remediation waste under all of the following conditions:

- Storage for no longer than 180 days;
- Wind dispersal of piled waste controlled by means other than wetting;
- No generation of leachate through decomposition or other reactions; and
- Storage site with a liner, cover, and run-on control system.

There are requirements, in turn, for the liner, cover, and run-on control system. These components are discussed in the following sections and illustrated in Exhibit 3-1.

#### 3.4.1 Liner Requirements

The liner for the storage site must meet all of the following conditions:

- Prevent migration of wastes into the adjacent subsurface soil, groundwater, or surface water during the life (including closure) of the storage site. However, the liner may allow waste to migrate into the liner.
- Have the chemical and physical properties (sufficient strength and thickness) to withstand
  - Pressure gradients (such as static head and external hydrogeologic forces),
  - Physical contact with the waste or leachate,
  - Climatic conditions,
  - Installation stress, and
  - Operation stress.
- Be placed on a foundation or base capable of
  - Supporting the liner; and
  - Resisting pressure gradients above and below the liner to avoid failure due to settlement, compression, or uplift.
- Be installed to cover all surrounding earth likely to be in contact with the waste.

#### 3.4.2 Cover Requirements

The cover for the storage site must meet all of the following conditions:

- Prevent migration of wastes into the adjacent subsurface soil, groundwater, or surface water during the life (including closure) of the storage site. However, the cover may allow waste to migrate into the cover.

- Be installed to cover all of the stored waste likely to be in contact with precipitation.
- Be secured against wind forces expected under normal weather conditions at the storage site.

#### 3.4.3 Run-on Control System

Exhibit 3-1 shows the difference between a run-off and run-on control system. Run-off is generally precipitation that falls on the cover. Run-on is surface water that flows down the terrain towards the cover. No run-off control system is necessary if the cover is designed to touch the containment sideslope in such a way as to not leave a gap that traps water (see exhibit). Run-off that could contact the waste or leachate must be managed as leachate. Run-on must always be controlled or diverted from reaching the waste or causing the waste to spread.

The run-on control system for the storage site must meet all of the following conditions:

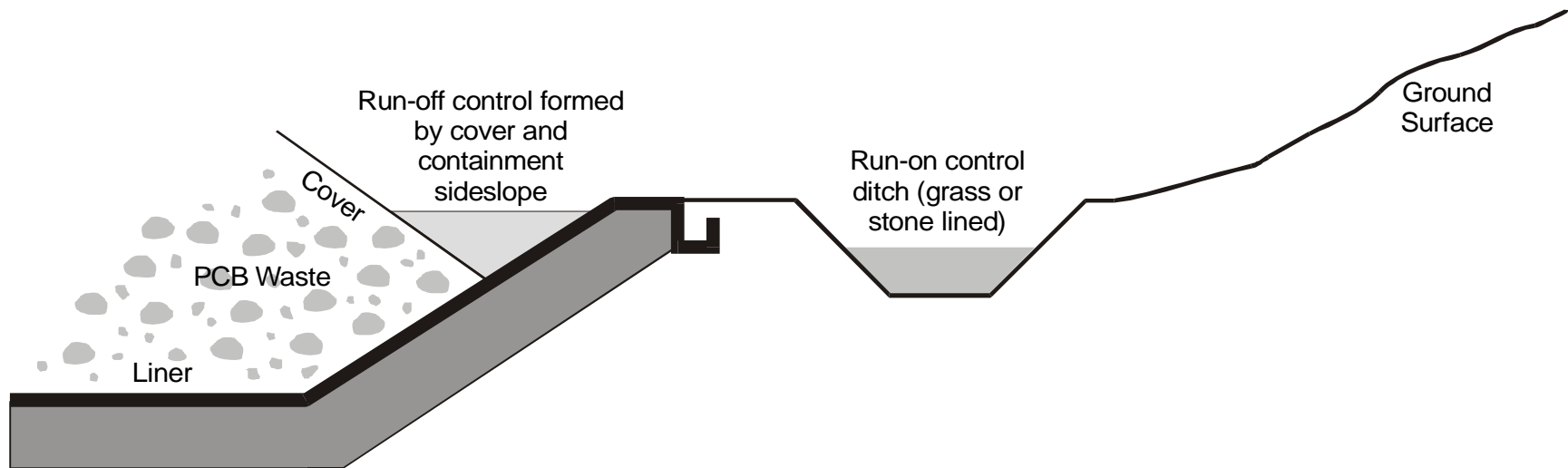
- Prevent flow onto the stored waste during peak discharge from at least a 25-year storm;
- Collect and control at least the water volume resulting from a 24-hour, 25-year storm; and
- Be emptied or otherwise managed expeditiously after a storm to maintain the design capacity of the system.

The above requirements may be altered through (or alternative storage can be sought through) the risk-based option for PCB remediation waste (see Section 4.4.2.3).

### 3.5 PCB Bulk Product Waste

If PCB bulk product waste is stored for 30 days or less, it may be placed in temporary storage (see Section 3.1.3). For more than 30 days, there is an

Exhibit 3-1. Cross-Section of 180-Day On-Site PCB Waste Storage Unit



alternative to storing this waste in a general storage or alternate storage unit (see Section 3.1.4 or 3.1.5, respectively). In the PCB Disposal Amendments Rule, EPA added 40 CFR 761.65(c)(9) to provide for on-site storage of PCB bulk product waste. The conditions for on-site storage of this waste are the same as those given for on-site storage of bulk PCB remediation waste (see Exhibit 3-1 and Section 3.4).

For the storage site, EPA specifies requirements for the liner, cover, and run-on control system, summarized in Sections 3.4.1, 3.4.2, and 3.4.3, respectively. These requirements may be altered (or alternative storage can be sought) by exercising the risk-based option for PCB bulk product waste (see Section 4.5.3).

## 3.6 PCB/Radioactive Waste

Three exceptions apply to the storage of PCB/radioactive waste: one-year storage limit, curbing under the general storage unit, and non-DOT containers.

### 3.6.1 Exception to the One-Year Limit

PCB/radioactive waste removed from service for disposal is exempt [40 CFR 761.65(a)(1)] from the one-year limit (discussed in Section 3.1.1) under the following conditions:

- Maintain written records to document all continuing attempts to secure disposal until the waste is disposed [40 CFR 761.65(a)(2)(ii)];
- Make these records available to EPA upon request [40 CFR 761.65(a)(2)(iii)]; and
- Manage waste in accordance with all other applicable laws and regulations for radioactive material (e.g., Atomic Energy Act).

PCB/radiation waste that is exempt from the one-year storage disposal time limit is also exempt from the exception reporting requirements of 40 CFR

761.215(c), (d), and (e).

### 3.6.2 Exception to Curbing Requirement

PCB/radioactive wastes are not required to be stored in an area with the minimum 6-inch-high curbing required for general storage units (see Section 3.1.4). However, the area must still provide a containment volume equal to at least the greater of the following:

- Twice the internal volume of the largest PCB Container, or
- 25% of the total internal volume of all PCB Containers stored therein.

The exception is provided by 40 CFR 761.65(b)(1)(ii).

### 3.6.3 Exception to DOT Containers

There are two exceptions to the requirement to use DOT containers: non-DOT containers and old DOT Specification containers.

#### 3.6.3.1 Non-DOT Containers

Containers other than those specified in Section 3.1.6 may be used for PCB/radioactive waste provided that:

- If they are used for liquid PCB/radioactive wastes, they are non-leaking;
- If they are used for non-liquid PCB/radioactive wastes stored in an area with a containment volume [prescribed in Section 3.6.2 summarizing 40 CFR 761.65(b)(1)(ii)], they are designed to prevent buildup of liquids; and
- Whether used for liquids or non-liquids, they meet all requirements pertaining to nuclear criticality safety. Container materials, such as polyethylene and stainless steel, are acceptable contingent upon compatibility with the stored wastes. Other materials

### 3. Storage of PCB Waste

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may be used if there are data to demonstrate to the EPA Regional Administrator and other appropriate regulatory authorities (e.g., Nuclear Regulatory Commission, DOT, and DOE) that the containers are protective of health, safety, and the environment.

- Used on a transitional basis as prescribed by 49 CFR 171.14(a)(2) (for example, the filling of these containers prior to October 1, 1996 without emptying and refilling them after that date).

Note that non-DOT containers must still meet other applicable Federal and State regulations governing radioactive materials.

### 3.7 Waste from Research and Development Activities

In accordance with 40 CFR 761.30(j)(2), all wastes resulting from research and development activities (including clothing) must be stored in a general storage unit (Section 3.1.4) or an alternate storage unit (Section 3.1.5).

#### 3.6.3.2 Old DOT Specification Containers

The other exception is that the old DOT Specification containers (as described in Exhibit 3-2) may be used for PCB/radioactive wastes under one of the following conditions:

- Used for storage (and not for transportation regulated by DOT – for example, movement from one facility to another without crossing a public road); or

**Exhibit 3-2. Old DOT Specification Containers**

DOT Specification Container	Description	Liquids	Non-Liquids
5	5- to 110- gallon steel drum without removable head	yes	yes
5B	5- to 110-gallon steel drum without removable head	yes	yes
6D with 2S or 2L liner	5- to 55-gallon cylindrical steel overpack with polyethylene liner	yes	no
17C	5- to 55-gallon steel drum	no	yes
17	5- to 55-gallon steel drum	yes	no

## 4. DISPOSAL OF PCB WASTE

The disposal of PCB waste is divided into the following areas: general requirements and specific requirements. Specific requirements cover PCB liquids, PCB Items, PCB spills and PCB remediation waste, PCB bulk product waste, PCB/radioactive waste, waste from research and development activities, and decontamination waste and residue.

### 4.1 General Requirements

Three types of general requirements must be taken into account for disposal: general prohibitions, health and safety, and processing.

#### 4.1.1 General Prohibitions

The use of waste oil containing PCBs at any detectable concentrations is prohibited by 40 CFR 761.20(d) (see text box). The following general

##### Waste Oils with any PCBs

Waste oils with any PCBs may not be disposed by using them for certain purposes. In particular, waste oil with PCBs may not be used as sealant, coating, dust control, road oiling, a pesticide or herbicide carrier, or rust preventative on pipes. However, waste oil with < 50 ppm of PCBs may be burned for energy recovery if the requirements in 40 CFR 761.20(e) are met.

prohibitions [40 CFR 761.50(a)] apply to disposal of all PCB waste:

- No open burning {combustion in an incinerator or high-efficiency boiler [40 CFR 761.60(a)] or other approved method [40 CFR 761.60(e)] is not open burning}.
- No processing of PCB liquids into non-liquid forms to avoid combustion.

- No discharging of water containing PCBs to a Federal or public treatment works [40 CFR 503.9(aa)] or navigable waters unless PCB concentration is

$S < 3 \text{ Fg/L} (< 3 \text{ ppb})$  or

$S$  Within the discharge limit set in a Clean Water Act section 307(b) or 402 permit.

- No diluting of PCBs to avoid a regulatory requirement unless specifically provided for [40 CFR 761.1(b)(5)].

As a reminder, observe all other Federal, State, and local laws and regulations applicable to the disposing PCB waste.

#### 4.1.2 Health and Safety

Persons disposing PCB Articles must don personal protective equipment to avoid dermal contact with or inhalation of PCBs [40 CFR 761.60(b)(1)(i)(B) and (b)(8) and 761.79(e)(2)]. As a best management practice, apply these practices while handling any PCB waste.

#### 4.1.3 Processing for Disposal

In the PCB Disposal Amendments, EPA clarified the types of processing for disposal requiring approval [40 CFR 761.20(c)(2)]. In general, processing activities primarily associated with and that facilitate treatment [as defined in 40 CFR 261.10] require a TSCA PCB Disposal Approval. Such activities include microencapsulation, pulverization, and particle size separation. Any diluting, blending, or other processing of a PCB waste (prior to its introduction for disposal) for the purposes of meeting a PCB concentration limit requires such an approval. Augers or hoppers feeding non-liquid PCBs or other technologies that introduce non-liquid PCBs for disposal are examples of the kinds of processing that require such an approval. Moreover, when the rate of delivery of

## 4. Disposal of PCB Waste

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liquid or non-liquid PCBs into a disposal unit is an operating parameter, the rate is subject to such as approval.

On the other hand, processing activities primarily associated with and facilitate storage, transportation, and that disposal do not require approval. These activities include repackaging, consolidating, pumping, draining, dismantling, and disassembling.

### 4.2 PCB Liquids

PCB liquids must be disposed by combustion; alternative technology for combustion must be approved by EPA. Incidental or so-called "environmental" PCB-contaminated liquids may be landfilled under certain conditions.

#### 4.2.1 Combustion

Liquids with  $\leq 50$  ppm of PCBs must be disposed in an incinerator [40 CFR 761.70] as specified in 40 CFR 761.60(a).

However, you may also dispose a liquid with PCBs at a concentration  $\leq 50$  ppm and  $< 500$  ppm in a:

- High-efficiency boiler specified in 40 CFR 761.71(a), if a mineral oil dielectric fluid, or
- High-efficiency boiler specified in 40 CFR 761.71(b), if **not** a mineral oil dielectric fluid.

#### 4.2.2 Alternatives to Combustion

In order to use an alternative method of destroying PCBs [40 CFR 761.60(e)], you must submit a written request to the EPA Regional Administrator or Director, National Program Chemicals Division at EPA Headquarters. (Send requests to use such a method in more than one region to the latter.) You must demonstrate that the alternative method:

- Achieves a level of performance equivalent to:
  - High-efficiency boiler [40 CFR 761.71], or

- Incinerator [40 CFR 761.70], and

- Does not present an unreasonable risk of injury to health or the environment.

Upon approval of an alternative method, EPA will set forth in writing all the conditions with which you must comply. Do not use the alternate method prior to approval.

#### 4.2.3 Landfilling of PCB Liquids

Generally, PCB liquids are banned from landfills. However, concern expressed about incidental PCB liquids associated with non-liquid wastes, which are usually of an aqueous nature, led EPA to insert the following provision [40 CFR 761.60(a)(3)]:

A PCB-Contaminated liquid (i.e.,  $< 500$  ppm of PCBs) may be placed in a chemical waste landfill approved under 40 CFR 761.75 if all four of the following conditions are met:

- It is from an incidental or "environmental" source, such as
  - Precipitation,
  - Condensation,
  - Leachate, or
  - Load separation;
- It is associated with PCB Articles or non-liquid PCB wastes; and
- You provide the owner/operator of the landfill with information showing that the liquid is
  - $< 500$  ppm of PCBs and
  - Not an ignitable waste [see 40 CFR 761.75(b)(8)(iii)].

Note that this landfill provision does not apply to PCB liquids (Section 4.2.1) or liquid PCB remediation waste (Section 4.4.2).

### **4.3 PCB Items**

Disposal requirements are explicitly specified for PCB Items, which are comprised of PCB Articles and PCB Containers. The disposal requirements for PCB Articles cover PCB Transformers, PCB Capacitors, PCB hydraulic machines, and PCB-Contaminated Electrical Equipment. The disposal requirements for PCB Containers and PCB Article Containers are discussed together.

Whenever a requirement is given to dispose of a PCB Item by combustion (i.e., incineration or high-efficiency boiler), you may use an alternative method. The requirements for obtaining approval of an alternative method are the same as for combustion of PCB liquids. [Section 4.2.2 summarizes the requirements for an alternative method from 40 CFR 761.60(e)].

#### **4.3.1 PCB Articles**

The discussion of PCB Articles is divided into general requirements and specific requirements (for PCB Transformers, capacitors, PCB hydraulic machines, PCB-Contaminated Electrical Equipment, and other PCB Articles).

##### *4.3.1.1 General Requirements*

Prior to 1998, certain drained PCB Articles and drained PCB-Contaminated Electrical Equipment were not regulated for disposal. However, the widespread disposal of such drained PCB Articles in furnaces for metal recovery by a metal smelter resulted in uncontrolled or open burning, and which caused concerns about the release of products of incomplete combustion (namely, highly toxic polychlorinated dibenzodioxins and dibenzofurans). Therefore, in the PCB Disposal Amendments Rule, EPA prohibited open burning [40 CFR 761.50(a)(1)] and specified operating conditions for scrap metal recovery ovens and smelters [40 CFR 761.72] in order to control releases.

##### *4.3.1.2 PCB Transformers*

A PCB Transformer must be disposed [40 CFR 761.60(b)(1)] in any of the following:

- Incinerator specified in 40 CFR 761.70, or
- Chemical waste landfill approved under 40 CFR 761.75, provided the PCB Transformer is
  - S** Drained of free-flowing liquid;
  - S** Filled with a solvent in which PCBs are readily soluble (e.g., kerosene, xylene, or toluene);
  - S** Allowed to stand for at least 18 hours before thoroughly removing (i.e., pumping or evacuating) the solvent, which must be disposed as a PCB liquid (see Section 4.2.1); and the solvent flushing is conducted per occupational safety and health standards.

##### *4.3.1.3 Capacitors*

The disposal requirements for capacitors cover PCB small Capacitors (also known as Small PCB Capacitors) and PCB Large Capacitors.

##### Small Capacitors

The disposal requirements for Small PCB Capacitors depend on whether you, the disposer,

- Manufactured these items or PCB Equipment containing these items, or
- Acquired these items in the course of manufacturing.

If you answer no for both conditions, the Small PCB Capacitors qualify for disposal as municipal solid waste. Otherwise, you must place the Small PCB Capacitors in DOT containers (see Section 3.1.6), and dispose them in any of the following:



#### 4. Disposal of PCB Waste

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- Incinerator specified in 40 CFR 761.70; or
- Chemical waste landfill approved under 40 CFR 761.75 provided that
  - S The interstitial space in the container has been filled with sufficient absorbent to take up any PCB liquids remaining in the PCB small Capacitors, and
  - S EPA has published a notice declaring the availability of such landfills, and the terms and conditions for landfilling are followed.

Notwithstanding, if you generated large amounts of Small PCB Capacitor waste that qualify for municipal solid waste (because they are intact and non-leaking), EPA encourages you to dispose the waste in either an incinerator or chemical waste landfill under the above conditions.

The reference for disposal of Small PCB Capacitors is 40 CFR 761.60(b)(2)(ii), (iv), (v), and (vi).

##### Large Capacitors

PCB Large Capacitors consist of PCB Large High Voltage and PCB Large Low Voltage Capacitors. Dispose PCB Large Capacitors with \$500 ppm of PCBs in either an incinerator or chemical waste landfill under the same conditions as described above for small PCB Capacitors that may not be disposed as municipal solid waste. Dispose PCB Large Capacitors with \$ 50 ppm and < 500 ppm of PCBs in an approved PCB disposal facility (see Exhibit 4-1).

The reference for disposal of PCB Large Capacitors (\$ 500 ppm of PCBs) is 40 CFR 761.60(b)(2)(iii), (v), and (vi) and that for disposal of PCB Large Capacitors (\$ 50 and < 500 ppm of PCBs) is 40 CFR 761.60(b)(4).

##### *4.3.1.4 PCB Hydraulic Machines*

PCB hydraulic machines (such as die casting machines) containing \$50 ppm of PCBs must be drained of all free-flowing liquid [40 CFR 761.60(b)(3)]. You must dispose the liquid as a PCB liquid (see Section 4.2.1). You may then dispose the drained carcass as described below.

If the liquid contained \$1,000 ppm of PCBs, an additional step (see Exhibit 4-2) is required in which the carcass must be:

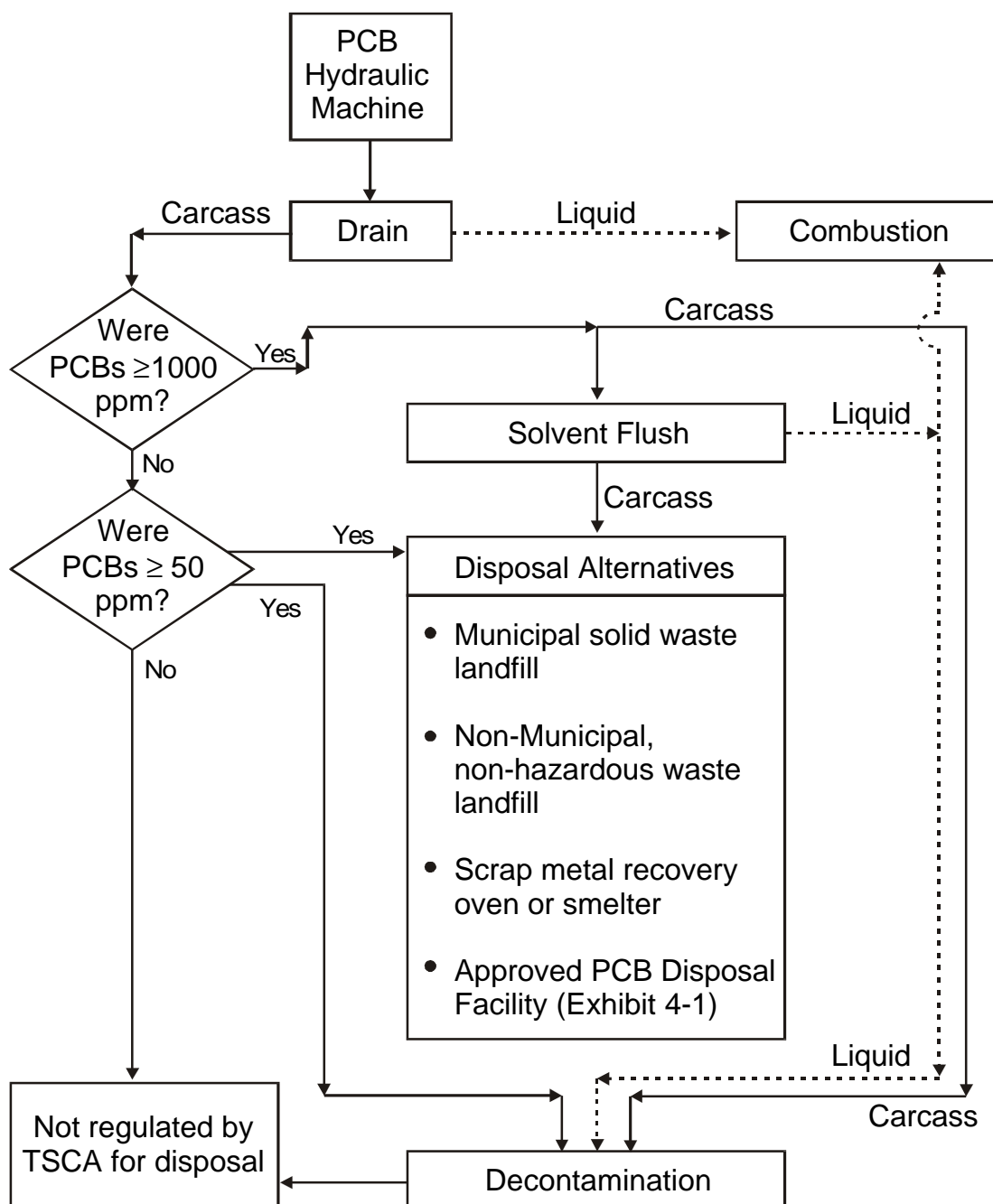
- Decontaminated per 40 CFR 761.79, or
- Flushed with a solvent (1) in which PCBs are readily soluble (e.g., kerosene, xylene, or toluene) and (2) that contains originally < 50 ppm of PCBs; dispose the spent solvent as a PCB liquid (see Section 4.2.1) or decontaminate it (per 40 CFR 761.79).

You must dispose the drained carcass (see Exhibit 4-2) via any of the following:

- Decontamination per 40 CFR 761.79 (not necessary if initial decontamination was performed adequately);

#### **Exhibit 4-1. List of PCB Disposal Facilities Approved under Subpart D**

Incinerators	40 CFR 761.70
High-Efficiency Boilers	40 CFR 761.71
Scrap Metal Recovery Ovens and Smelters	40 CFR 761.72
Chemical Waste Landfill	40 CFR 761.75

**Exhibit 4-2. Disposal of PCB Hydraulic Machine**

## 4. Disposal of PCB Waste

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- Municipal solid waste management facility (excluding thermal treatment units and subject to 40 CFR Part 258) permitted, licensed, or registered by a state;
- Non-municipal, non-hazardous waste management facility (excluding thermal treatment units and subject to 40 CFR 257.5 through 257.30) permitted, licensed, or registered by a state;
- Scrap metal recovery oven or smelter as specified in 40 CFR 761.72 (also see discussion in Section 4.3.1.1); or
- Disposal facility approved in 40 CFR Part 761 (see Exhibit 4-1).

### 4.3.1.5 *PCB-Contaminated Electrical Equipment (except capacitors)*

PCB-Contaminated Electrical Equipment (except capacitors) must be drained of all free-flowing liquid [40 CFR 761.60(b)(4) and (b)(6)(ii)]. Dispose the liquid as PCB liquid (see Section 4.2.1). Dispose the drained carcass in any of the following:

- Decontamination per 40 CFR 761.79 [40 CFR 761.60(b)(4) and 761.60(b)(6)(ii)(A)],
- Municipal solid waste management facility (excluding thermal treatment units and subject to 40 CFR Part 258) permitted, licensed, or registered by a state;
- Non-municipal, non-hazardous waste management facility (excluding thermal treatment units and subject to 40 CFR 257.5 through 257.30) permitted, licensed, or registered by a state;
- Scrap metal recovery oven or smelter as specified in 40 CFR 761.72 (also see discussion in Section 4.3.1.1); or
- Disposal facility approved in 40 CFR Part 761 (see Exhibit 4-1).

### 4.3.1.6 *Other PCB Articles*

PCB Articles (other than those previously described, namely, PCB Transformer, capacitor, PCB hydraulic machines, and PCB-Contaminated Electrical Equipment) having \$ 500 ppm of PCBs must be disposed [40 CFR 761.60(b)(6)(i)] in any

- Incinerator as specified in 40 CFR 761.70, or
- Chemical waste landfill approved under 40 CFR 761.75 provided that all free-flowing liquid is drained and the liquid is disposed as a PCB liquid (as specified in Section 4.2.1).

PCB Articles (other than those previously described) having \$ 50 ppm but < 500 ppm of PCBs must be disposed [40 CFR 761.60(b)(6)(ii)] by draining all free-flowing liquid and disposing the liquid as a PCB liquid (as specified in Section 4.2.1) prior to disposing the drained carcass via any of the following:

- Decontamination per 40 CFR 761.79;
- Municipal solid waste management facility (excluding thermal treatment units and subject to 40 CFR Part 258) permitted, licensed, or registered by a State;
- Non-municipal, non-hazardous waste management facility (excluding thermal treatment units and subject to 40 CFR 257.5 through 257.30) permitted, licensed, or registered by a State;
- Scrap metal recovery oven or smelter as specified in 40 CFR 761.72 (also see discussion in Section 4.3.1.1); or
- Disposal facility approved in 40 CFR Part 761 (see Exhibit 4-1).

Note that all persons directly involved in the disposal of PCB Articles must don personal protective clothing or equipment to avoid dermal contact with or inhalation of PCBs [40 CFR 761.60(b)(8)].

### 4.3.2 PCB Containers

PCB Containers that came in contact with  $\geq 500$  ppm of PCBs must be disposed [40 CFR 761.60(c)] via:

- Decontamination per 40 CFR 761.79,
- Incineration as specified in 40 CFR 761.70, or
- Chemical waste landfill approved under 40 CFR 761.75 provided that all free-flowing liquid is drained and the liquid is disposed as a PCB Liquid (as described in Section 4.2.1).

PCB Containers that came into contact with  $< 500$  ppm of PCBs must be drained of all free-flowing liquid and the liquid disposed as a PCB Liquid (as described in Section 4.2.1). Dispose the drained PCB Container as municipal solid waste.

### 4.3.3 PCB Article Containers

PCB Article Containers that have not come into direct contact with PCBs are not regulated for disposal. On the other hand, PCB Article Containers that have come into direct contact with PCBs (because of a leaking PCB Article within) are by definition [40 CFR 761.3] PCB Containers. Therefore, such PCB Article Containers are disposed in the same manner as PCB Containers.

## 4.4 PCB Spills and PCB Remediation Waste

This section discusses pre-1978 spills, post-1978 spills, and the options for PCB remediation waste.

### 4.4.1 PCB Spills or Releases

EPA distinguishes between PCB spills or releases occurring before April 18, 1978, (so-called pre-1978 spills) and those occurring on that date and afterwards (post-1978 spills). If the date of the spill or release is in question, the owner/operator of the spill or release site bears the burden of proof.

#### 4.4.1.1 Pre-1978 Spills

40 CFR 761.50(b)(3) provides that sites where PCBs have spilled or spilled material has been placed in a land disposal facility (e.g., dump, landfill, waste pile, or land treatment unit) are presumed not to present an unreasonable risk to health or the environment. Thus, EPA does not require further disposal action to address such sites.

However, on a case-by-case basis, the rule allows an EPA Regional Administrator to make a finding to the contrary, that is, that such a site poses an unreasonable risk. For example, there may be leaching or leaking from a pre-1978 PCB disposal site that endangers groundwater.

Once the EPA Regional Administrator makes this finding, the Administrator may direct the owner/operator of the site to dispose the PCB remediation waste (in a manner summarized in Section 4.4.2) until the site no longer poses an unreasonable risk.

In the event that you are the owner/operator of such a site and choose unilaterally and voluntarily to cleanup the site, you are not relieved from the applicable regulations for that waste. For instance, since sites contaminated with PCBs often are contaminated with other hazardous wastes, such as metals and organic solvents, you are advised to coordinate the cleanup with the regulatory authority for RCRA or Superfund.

#### 4.4.1.2 Post-1978 Spills

With respect to sites containing PCB remediation wastes generated on or after April 18, 1978, you as an owner/operator have two choices for executing cleanup and disposal:

- As PCB Remediation Waste (40 CFR 761.61 -- summarized in Section 4.4.2), or
- Under 40 CFR 761 Subpart G, "PCB Spill Cleanup Policy," (40 CFR 761.120 to 761.135).

#### 4. Disposal of PCB Waste

See text box, “761.61 versus Subpart G.” Exhibit 4-3 provides a comparison of the cleanup under Subpart G and 761.61.

##### 4.4.2 PCB Remediation Waste

PCB remediation waste may be disposed via the self-implementing, performance-based, or risk-based option.

##### 4.4.2.1 Self-implementing Option

###### Applicability

The self-implementing option may be used for

cleanup and disposal of PCB remediation waste for media **other than the following**:

- Surface or ground waters,
- Sediments in marine or freshwater ecosystems,
- Sewer or sewage treatment systems,
- Drinking water sources or distribution systems (regardless of private or public),
- Grazing lands, or
- Vegetable gardens.

### Exhibit 4-3. Comparison of Cleanup under the PCB Spill Cleanup Policy and the Self-Implementing Cleanup of PCB Remediation Waste

Qualifications and Conditions	Spill Cleanup Policy	Self-Implementing Disposal
When can the spill have occurred?	Fresh spills.	No restriction.
When must cleanup begin?	Within 24/48 hours of the spill.	No limit.
Site size restrictions	Approximately 20 feet in diameter.	None, designed for moderate sized sites (less than one acre).
Notification to EPA required?	If greater than 10 pounds of PCBs spilled, yes, if not no.	Always, regardless of the amount of PCB.
Cleanup levels	Depends on where the spill is and the kind of material (soil or impervious surface).	Depends on where the spill is and the kind of material (bulk PCB remediation waste/porous surface, non-porous surface, or liquid).
Post-Cleanup Verification Sampling	Triangular grid, maximum number of samples is 40, options for other procedures.	Square-based grid, no limit on number of samples, options for other procedures.
Penalty for spill?	No.	Possible.
Disposal of cleanup wastes	Based on the concentration of the original spilled material.	Based on the concentration of the waste as found.

### 761.61 versus Subpart G

Note that EPA intended the new 40 CFR 761.61 to address more spill scenarios than Subpart G. While Subpart G applies to PCB spills or releases occurring after the effective date of Subpart G – May 4, 1987, 40 CFR 761.61 applies to almost all spills (see Exhibit 2-5). EPA also emphasizes that while Subpart G is only an enforcement policy that applies to spills or releases from authorized PCB uses, 40 CFR 761.61 is a regulation. The implication is that Subpart G is not an “applicable or relevant and appropriate requirement (ARAR)” in cleanups under the Comprehensive Environmental Response, Compensation, and Liability Act.

In the PCB Disposal Amendments, EPA did not revise or expand the scope of Subpart G. However, EPA incorporated many of the assumptions of Subpart G into 40 CFR 761.61, such as the two scenarios for exposure -- high occupancy and low occupancy. This guidance booklet focuses only on 40 CFR 761.61.

The above sites are not allowed for the self-implementing option because of their higher sensitivity to the toxic effects of PCBs. In fact, the EPA Regional Administrator may impose a more stringent cleanup of a site near human or animal populations (see the subsection titled Cleanup Levels below).

The self-implementing option is also not binding in cleanups under RCRA or Superfund. In other words, the decision to deploy a particular option (self-implementing, performance-based, or risk-based) is determined not by the owner/operator for the site but by the remedy selection process.

The applicability of the self-implementing option is given at 40 CFR 761.61(a)(1).

### Site Characterization

The site being cleaned up under the self-

implementing option must be characterized adequately to provide the information (specified in the next subsection, Notification and Certification) to enable the EPA Regional Administrator to review the cleanup plan [40 CFR 761.61(a)(2)]. Subpart N (40 CFR 761.260 to 761.274) provides a method for characterizing a PCB remediation site. You also may use it to assess the adequacy of existing site characterization data collected by other methods.

Dispose all samples and wastes from chemical analyses as waste from research and development activities (see Section 4.7).

### Reporting of Sampling Data

In site characterization data, you must report non-liquid sample results on a dry weight basis as Fg/g of sample. Report liquid sample results on a wet weight basis as Fg/g of sample (or ppm by weight). Report surface sampling results as Fg/100 cm<sup>2</sup>.

### Notification and Certification

As an owner/operator executing the self-implementing option, you are required [40 CFR 761.61(a)(3)] to provide written notice of the cleanup except in emergencies (see textbox on next page). At least 30 days prior to the initiation of cleanup at a site, you must send a written notice to the following:

- EPA Regional Administrator,
- State or tribal environmental protection agency, and
- County or local environmental protection agency.

The written notice must include the following:

- Nature of contamination (including kinds of materials contaminated);

#### 4. Disposal of PCB Waste

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- Summary of procedures for sampling the site and its surroundings (including sample collection procedures and analysis dates);
- Map or table showing concentration levels from site characterization (the EPA Regional Administrator may require more details, such as sample identification numbers used in site characterization);
- Location and extent of the contamination, including topographic maps cross-referencing sample identification numbers;

- Cleanup plan for the site, including the

§ Schedule,

§ Disposal technology, and

§ Approach.

The plan should discuss options and contingencies, such as when obstacles or unexpectedly high concentrations are encountered.

The property owner of the cleanup site and the party conducting the cleanup both must sign a written certification. The certification must state that following are available for EPA inspection at the place stated by the signatories:

- Sampling plans, and
- Procedures for sample collection, preparation, extraction, and instrumental/chemical analysis.

If alternate methods for chemical extraction and chemical analysis are used, include in the certification a statement about the

- Use of such methods, and a
- Comparison study showing that the requirements of Subpart Q (40 CFR 761.320 through 761.326) are met or exceeded.

Records on both the alternate methods and the comparison study, which must be completed before the verification sampling, must be on file.

The EPA Regional Administrator should respond in writing within 30 calendar days of receiving the notification. If not, assume that the cleanup plan is complete and proceed with the plan.

Provide any proposed changes from the notification to the EPA Regional Administrator in writing no less than 14 calendar days prior to executing the changes.

##### **Emergencies**

A waiver is not necessary in the event of an emergency. Emergency cleanup is appropriate where there is imminent danger to health and the environment without containment or treatment. It is not appropriate for avoiding additional cleanup costs, business costs, or the 30-day wait.

In the event of an emergency, emergency response personnel should communicate directly with the EPA Region on proposed remedial actions.

The EPA Regional Administrator should respond verbally to the changes within 7 calendar days and in writing within 14 calendar days of receiving the changes. If there is neither verbal nor written response, assume the changes are complete and acceptable and proceed with the changes.

If you receive a separate waiver from each of the agencies required to be notified, you may obtain a waiver of the 30-day notification requirement.

##### Cleanup Levels

Cleanup levels (in terms of PCB concentrations) and conditions are given as a function of the type of occupancy (high or low) and PCB remediation waste for a given site [40 CFR 761.61(a)(4)]. Note

that there are four types of PCB remediation waste with established cleanup levels: bulk PCB remediation waste, non-porous surfaces, porous surfaces, and liquid PCB remediation waste. The cleanup levels for non-liquid PCB remediation waste are given in Exhibit 4-4. The cleanup levels for liquid PCB remediation waste are given in Exhibit 4-5, which are the same as the decontamination standards for liquids with PCBs given in 40 CFR 761.61(b)(1) and (b)(2).

In Exhibits 4-4 and 4-5, a high-occupancy area means an area occupied \$840 hours/year (\$ an average of 16.8 hours/week) for non-porous surfaces and 335 hours/year (\$ an average of 6.7 hours/week) for bulk PCB remediation waste and porous surfaces. Examples of high-occupancy areas are residences, schools, day care centers, and a work station on an assembly line. Low occupancy areas are areas other than high-occupancy areas. Examples of low-occupancy areas are electrical substations, electrical equipment vaults, and non-

**Exhibit 4-4.**  
**Table of Cleanup Requirements for Non-Liquid PCB Remediation Waste**

Type of PCB Remediation Waste	Occupancy	Cleanup Level for PCBs	Condition
Bulk PCB Remediation Waste  (soil, sediment, dredged materials, debris, muds, PCB sewage sludge, and industrial sludge)	High	# 1 ppm	No further conditions
	High	> 1 ppm and # 10 ppm.	Cap the site; deed restriction
	Low	# 25 ppm	Deed restriction
	Low	> 25 ppm and # 50 ppm	Fence the site with signs bearing M <sub>L</sub> mark; deed restriction
	Low	> 25 ppm and # 100 ppm	Cap the site; deed restriction
Non-porous Surface  (smooth, unpainted solid surface that limits penetration of liquid with PCBs)	High	# 10 Fg/100 cm <sup>2</sup>	No further conditions
	Low	< 100 Fg/100 cm <sup>2</sup>	Deed restriction
Porous Surfaces  (a surface that allows PCBs to penetrate or pass into itself )	High	# 1 ppm	No further conditions
	High	> 1 ppm and # 10 ppm.	Cap the site; deed restriction
	Low	# 25 ppm	Deed restriction
	Low	> 25 ppm and # 50 ppm	Fence the site with signs bearing M <sub>L</sub> mark; deed restriction
	Low	> 25 ppm and # 100 ppm	Cap the site; deed restriction

Note: High occupancy areas are areas occupied \$ 840 hours/year (\$ average of 16.8 hours/week) for non-porous surfaces and \$ 335 hours/year (\$ average of 6.7 hours/week) for bulk PCB remediation waste and porous surfaces. All other areas are low occupancy areas.



#### 4. Disposal of PCB Waste

**Exhibit 4-5.**  
**Table of Cleanup Requirements for Liquid PCB Remediation Waste**  
(Same as decontamination standards for liquids with PCBs)

Type of PCB Remediation Waste	Occupancy	Cleanup Level for PCBs	Condition
Liquid PCB Remediation Waste	High or Low	< 200 Fg/L (< 200 ppb) in water	Non-contact use in a closed system with no releases 40 CFR 761.79(b)(1)(i)]
		< 3 Fg/L (<3 ppb) in water or discharge limit in Clean Water Act Section 307(b) or 402 permits	Discharge to treatment works or navigable waters [40 CFR 761.79(b)(1)(ii)]
		# 0.5 Fg/L (# 0.5 ppb) in water	No further conditions [40 CFR 761.79(b)(1)(iii)]
		< 2mg/kg (< 2 ppm) in organic and non-aqueous inorganic liquids	No further conditions [40 CFR 761.79(b)(2)]

Note: Associated with decontamination are several important requirements:  
40 CFR 761.79(e)(1) requires taking the necessary measures to prevent direct release of PCBs to the environment.  
40 CFR 761.79(e)(2) requires wearing personal protective equipment to guard against dermal contact with or inhalation of PCBs.  
40 CFR 761.79(f) requires sampling and analysis per 40 CFR 761.269 and 761.272 (both in Subpart N) in order to confirm decontamination levels are achieved. In addition, written records of sampling and analysis must be kept at least 3 years from the date of decontamination. Upon request, the records must be made available to EPA. Wastes generated by decontamination are subject to the disposal requirements and the recordkeeping requirements of 40 CFR 761.180(a).

office space in a warehouse. The occupancy rates are given for individuals not wearing dermal and respiratory protection against exposure to PCBs. Where there is a change in the land use of a site from low-occupancy to high-occupancy and the site was cleaned up at a low-occupancy level, the site must be recleaned up to the high-occupancy level. A notation recorded in the deed (or comparable instrument) for the property is required (see subsection, Deed Restrictions below).

Where a cleanup condition in Exhibit 4-4 requires a cap, also read the subsections, Cap Requirements and Deed Restrictions below. Moreover, where a

cleanup condition in Exhibit 4-4 requires a fence, also see the subsection, Deed Restrictions, below. The Deed Restriction subsection describes the conditions under which a cap or fence may be removed.

Note that the EPA Regional Administrator may require cleanup of a site to a level more stringent than that given in Exhibit 4-4 for sites near human and animal populations. Areas with human and animal populations include residential dwellings, hospitals, schools, nursing homes, playgrounds, parks, daycare centers, endangered species habitats, estuaries, wetlands, national wildlife refuges,

national parks, commercial fisheries, and sport fisheries. The EPA Regional Administrator will make any more stringent requirement known in the written response to the notification.

### Site Cleanup

The disposal methods alluded to in 40 CFR 761.60 (which are discussed in previous Sections 4.1 and 4.2) may be used to dispose PCB remediation waste as long as the conditions set forth for their use are met [40 CFR 761.61(a)(5)]. For example, you may use a scrap metal recovery oven or smelter to dispose of metal contaminated with PCBs from PCB remediation waste; however, you may not use it to dispose soil contaminated with PCBs from PCB remediation waste. In fact, none of the disposal methods in 40 CFR 761.60 are acceptable for disposing of soils containing PCBs. Also, do not use a method accepted for disposing PCBs of \$50 ppm and < 500 ppm to dispose PCBs of \$500 ppm. In addition to the methods discussed in Sections 4.2 through 4.3, Exhibit 4-6 provides disposal methods that may be used on PCB remediation waste.

### Cleanup Verification

The self-implementing option requires [40 CFR 761.61(a)(6)] verifying that the bulk PCB remediation waste or surfaces at a site be cleaned up to the prescribed levels (see subsection entitled Cleanup Levels above). The collection and analysis of samples for cleanup verification must be conducted according to the requirements applicable to the given type of PCB remediation as follows:

- Bulk PCB remediation waste, comply with Subpart O (40 CFR 761.280 to 761.298) for on-site disposal. Refer to Subpart R (40 CFR 761.340 to 761.359) for off-site disposal of non-metal, non-liquid PCB remediation waste.
- Porous surfaces, comply with Subpart O (40 CFR 761.280 to 761.298) for on-site disposal. Refer to Subpart R (40 CFR 761.340 to 761.359) for off-site disposal of

non-metal, non-liquid PCB remediation waste.

- Non-porous surfaces, comply with Subpart P (40 CFR 761.300 to 761.316) for sample site selection procedures regardless of whether disposal is on-site or off-site.
- Liquid PCB remediation waste, comply with Subpart N (40 CFR 761.269 to 761.272).

The four Subparts just cited may not be used to make conclusions or extrapolations about PCB concentrations outside the area which has been cleaned up and represented by sampling.

Note that Subpart O provides two sampling options. The choice of an option depends on whether the cleanup site is sufficiently small or irregularly shaped that a square grid with a grid interval of 1.5 meters will not result in a minimum of three sampling points. Both options use a square grid structure and grid interval corresponding to the largest interval provided in Subpart G -- PCB Spill Cleanup Policy. Both options also specify compositing of adjacent samples of the same size, give the maximum number of samples that can be composited, and require that composited samples be mixed thoroughly and subsampled before chemical analysis.

When the results of a sample analysis indicate that the concentration of PCBs is less than or equal to the appropriate cleanup level, consider the cleanup complete. Otherwise, you as the owner/operator of the site, must reclean the waste or surface and reinitiate sampling and analysis until the prescribed cleanup levels are attained.

The entire site does not need to be recleaned if a single sample fails to meet cleanup levels. The area that must be recleaned and reanalyzed is an area larger by one grid interval than the area represented by the failing sample [40 CFR 761.61(a)(6)(ii)(B)].

Dispose all samples and any waste from chemical analyses as waste from research and development activities (see Section 4.7).

#### 4. Disposal of PCB Waste

**Exhibit 4-6.**  
**Table of Disposal Methods for PCB Remediation Waste**

Type of PCB Remediation Waste	Method	Conditions
Bulk PCB Remediation Waste (soil)	soil washing or on-site cleaning	<ol style="list-style-type: none"> <li>1. Use non-chlorinated solvents,</li> <li>2. Use an ambient-temperature process,</li> <li>3. Use a non-exothermic process,</li> <li>4. Use a process not requiring external heat,</li> <li>5. Prevent releases through secondary containment, and</li> <li>6. Dispose/recover/reuse solvent per 40 CFR 761.79 or 761.61(b) or (c) approvals.</li> </ol>
	off-site decontamination followed by disposal	<ol style="list-style-type: none"> <li>1. Dewater the waste on-site or ship in DOT containers for off-site dewatering;</li> <li>2. Dispose removed water as PCB liquid (Section 4.2) or decontaminate (see Exhibit 4-5), and dispose dewatered waste as follows: <ul style="list-style-type: none"> <li>\$ If PCB concentration not characterized, assume \$ 50 ppm</li> <li>\$ If PCBs &lt; 50 ppm, see "Non-Liquid Cleanup Materials" in this table below</li> <li>\$ If PCBs \$50 ppm, put in a RCRA Subtitle C Landfill accepting PCB waste or an approved PCB disposal facility (see Exhibit 4-1)</li> <li>\$ If shipping to off-site disposal facility with no TSCA approval, give written notice [quantity &amp; highest PCB concentration determined by extraction (EPA method 3500B/3540C or 3500B/3550B) followed by analysis (EPA 8082 in SW-846)] at least 15 days before first shipment to the facility</li> </ul> </li> </ol>
	on-site decontamination and disposal	Decontaminate per 40 CFR 761.79
Non-porous Surfaces	cleaning followed by on-site or off-site disposal	<ol style="list-style-type: none"> <li>1. Decontaminate per 40 CFR 761.79,</li> <li>2. Use a combustion alternative method (see Section 4.2.2), or</li> <li>3. Use a method approved under the risk-based option (see Section 4.4.4).</li> </ol>
	cleaning followed by <b>off-site</b> disposal	<ol style="list-style-type: none"> <li>1. If surface &lt; 100 Fg PCBs/100 cm<sup>2</sup>, see "Non-Liquid Cleanup Materials" below</li> <li>2. If surface \$ 100 Fg PCBs/100 cm<sup>2</sup>, place in a RCRA Subtitle C Landfill accepting PCB waste or an approved PCB disposal facility (see Exhibit 4-1)</li> </ol>
	metals – thermal decontamination	<ol style="list-style-type: none"> <li>1. If surface &lt; 100 Fg PCBs/100 cm<sup>2</sup>, decontaminate per 40 CFR 761.79(c)(6)(i)</li> <li>2. If surface \$ 100 Fg PCBs/100 cm<sup>2</sup>, decontaminate per 40 CFR 761.79(c)(6)(ii)</li> </ol>
	use or reuse	Decontaminate per 40 CFR 761.79(b)(3) or (c)

**Exhibit 4-6.**  
**Table of Disposal Methods for PCB Remediation Waste (continued)**

Type of PCB Remediation Waste	Method	Conditions
Porous Surfaces	disposal	Dispose in same way as "Bulk PCB Remediation Waste" at top of the table
	decontamination followed by reuse	Decontaminate per 40 CFR 761.79(b)(4)
Liquid PCB Remediation Waste	decontamination	See Exhibit 4-5
	disposal	Dispose under performance-based option or risk-based option (see Section 4.4.3 or 4.4.4)
Non-Liquid Cleanup Materials  (Personal protective equipment waste at any PCB concentration and other non-liquid materials, including rags, gloves, booties, and other similar disposable materials)	disposal in solid waste management facility (see choices in the column to the right)	<ol style="list-style-type: none"> <li>1. Permitted, licensed, or registered to manage municipal solid waste under 40 CFR Part 258;</li> <li>2. Permitted, licensed, or registered to manage non-municipal, non-hazardous waste under 40 CFR 257.5 through 257.30;</li> <li>3. RCRA Subtitle C hazardous waste landfill permitted by a State to accept PCB waste; or</li> <li>4. PCB disposal facility approved under 40 CFR Part 761 (see Exhibit 4-1);</li> </ol> Note: Subpart K (40 CFR 761.202 to 761.218), "PCB Waste Disposal Records and Reports," does not apply.
	decontamination	Decontaminate per 40 CFR 761.79(b) or (c)
Cleaning solvents, abrasives, and equipment	decontamination followed by reuse	Decontaminate per 40 CFR 761.79

#### Cap Requirements

A cap may be used in order to attain a particular cleanup level (see Cleanup Levels). A cap is a uniform cover over a site which retards water infiltration into and resists erosion of underlying PCBs at a restricted concentration. The cap

requirements [40 CFR 761.61(a)(7)] are summarized in Exhibit 4-7. These requirements are for construction, soil parameters, minimum thickness of cap, strength, PCB contamination limit in cap, visual inspection, and maintenance.

See the subsection, Deed Restrictions, below for the conditions under which the cap may be removed.

## Exhibit 4-7. Cap Requirements

Type of Requirement	Specifications
Design and Construction	<ol style="list-style-type: none"> <li>1. Provide long-term minimization of liquid migration</li> <li>2. Function with minimum maintenance</li> <li>3. Promote drainage and minimize erosion or abrasion of cover</li> <li>4. Accommodate settling and subsidence to maintain integrity of cover</li> <li>5. Have permeability # that of bottom liner system or natural subsoil present</li> </ol> <p>[40 CFR 264.310(a)(1) through (a)(5)]</p>
Soil (high clay and silt content) Parameters	<ol style="list-style-type: none"> <li>1. Permeability # <math>1.0 \times 10^{-7}</math> cm/sec</li> <li>2. Percent soil passing No. 200 sieve &gt; 30</li> <li>3. Liquid limit &gt; 30</li> <li>4. Plasticity index &gt; 15</li> </ol> <p>[40 CFR 761.75(b)(1)(ii) through (b)(1)(v)]</p>
Minimum Thickness of Cap	<ol style="list-style-type: none"> <li>1. Soil (compacted): 25 cm (10 in.)</li> <li>2. Concrete or Asphalt: 15 cm (6 in.)</li> </ol> <p>[40 CFR 761.61(a)(7)]</p>
Strength	<p>Sufficient to maintain cap effectiveness and integrity during use of the cap surface which is exposed to the environment.</p> <p>[40 CFR 761.61(a)(7)]</p>
PCB Contamination in Cap	<p>&lt; 1 ppm per Aroclor (or equivalent) or per cogener</p> <p>[40 CFR 761.61(a)(7)]</p>
Maintenance	<p>Repair within 72 hours of discovery of any breaches that would impair integrity of cap; maintain cap in perpetuity.</p> <p>[40 CFR 761.61(a)(7) &amp; (a)(8)]</p>

### Deed Restrictions

Restrictions must be placed on the deed [40 CFR 761.61(a)(8)] for a property containing a site which has been remediated if the site is:

- c Capped,
- c Fenced, or a
- c Low-occupancy area.

(Refer to the subsection, Cleanup Levels, above, for more information on caps, fences, and low-occupancy areas.) Within 60 days of completing a self-implemented cleanup of a PCB remediation waste site, the owner must record a notation on the property deed (or comparable instrument that is normally examined during title searches) and submit a certification to the EPA Regional Administrator.

The purpose of the notation is to provide, in perpetuity, information to any potential purchaser of the property. The notation to be recorded (in a

manner according to state law) on the property deed (or comparable instrument) must state that the land:

- Has been used for PCB remediation waste disposal, and
- Is restricted to use as a low-occupancy area (as defined in 40 CFR 761.3) (applicable only if this is a condition of the level to which the site has been cleaned up). In addition, if a fence or cap is a condition of the level to which the site has been cleaned up (see Exhibit 4-4), then the notation must also state that the land:
- Has a cap or fence, and the cap or fence must be maintained, and
- Was left cleaned up to applicable levels (to be specified) inside the fence or cap.

The owner must submit a certification to the EPA Regional Administrator that the notation required above has been recorded in the property deed (or comparable instrument).

The owner may remove a fence or cap that is a result of a PCB remedial activity after conducting additional cleanup to achieve PCB levels not requiring a fence or cap (see Exhibit 4-4). The owner may remove the notice on the deed no earlier than 30 days after achieving the levels not requiring a fence or cap.

### Recordkeeping

There are recordkeeping requirements associated with notification and certification (see Notification and Certification), cleanup levels (see Cleanup Levels), site cleanup (see Site Cleanup), and cleanup verification (see Cleanup Verification). In addition, recordkeeping must also meet the requirements of 40 CFR 761.125(c)(5), the recordkeeping requirements under the PCB Spill Cleanup Policy.

The general recordkeeping requirement for self-implemented PCB remediation waste cleanup is

specified at 40 CFR 761.61(a)(9).

A flow chart summarizing the self-implementing option for PCB remediation waste appears in Exhibit 4-8.

#### 4.4.2.2. *Performance-based Option*

PCB remediation waste may be disposed by pre-approved methods or in pre-approved facilities [40 CFR 761.61(b)]. Because these pre-approved methods or pre-approved facilities must meet certain standards of performance, they are called performance-based options. There are basically two divisions of performance-based options: liquids and non-liquids.

Liquid PCB remediation waste must be disposed as PCB liquids by combustion (see Section 4.2.1) or an alternative to combustion (see Section 4.2.2). Liquid PCB remediation waste may also be decontaminated as prescribed by 40 CFR 761.79(b)(1) (which is summarized in Exhibit 4-5).

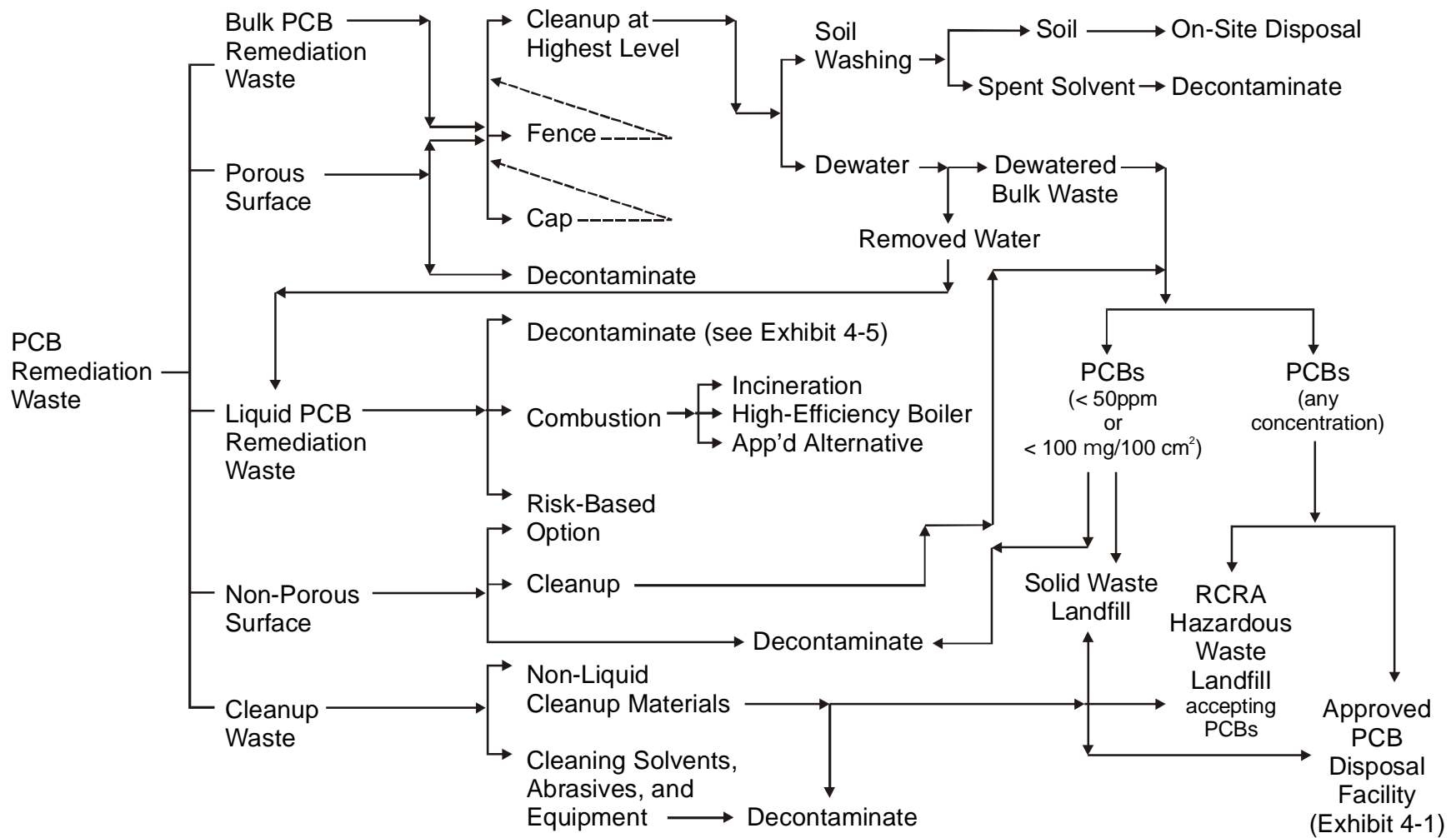
Non-liquid PCB remediation waste may be disposed via:

- Incineration (high-temperature) as specified in 40 CFR 761.70(b),
- Alternative to combustion (covered in Section 4.2.2),
- Chemical waste landfill approved under 761.75,
- Facility with a TSCA Coordinated Approval issued under 40 CFR 761.77, or
- Decontamination per 40 CFR 761.79.

#### 4.4.2.3 *Risk-based Option*

The third and last option by which PCB remediation waste may be disposed is the risk-based option [40 CFR 761.61(c)]. The risk-based option allows you to apply to the EPA Regional Administrator for your region (or to the Director of the National Program

**Exhibit 4-8. PCB Remediation Waste Self-Implementation Flow Chart**



Chemicals Division for more than one region) for approval of an alternative to the self-implementing or performance-based option. Include in the written application the information required by 40 CFR 761.61(a)(3), which is summarized in Section 4.4.2.1, Notification and Certification. EPA may request additional information in order to consider the application. Do not conduct any cleanup activities under the risk-based option prior to receiving written approval from EPA.

EPA considers applications for risk-based disposal of PCB remediation waste on a case-by-case basis. EPA will respond in writing to each application for a risk-based cleanup. As a general rule, EPA will approve an application if the alternative will not pose an unreasonable risk of injury to health and the environment.

Be advised that EPA intends to subject applications for risk-based disposal to a public hearing process [63 FR 35410]. The public hearing process may cause project delays.

### 4.5. PCB Bulk Product Waste

PCB bulk product waste may be disposed in four ways: performance-based option, solid waste landfills, risk-based option, and landfill cover or roadbed material.

#### 4.5.1 Performance-based Option

PCB bulk product waste may be disposed by certain methods or in specific facilities [40 CFR 761.62(a)]. Because these methods or facilities must be pre-approved and, more important, they must meet certain standards of performance, they are called performance-based options. There are seven performance-based options:

- Incineration as specified in 40 CFR 761.70;
- Chemical waste landfill approved under 761.75;
- Hazardous waste landfill permitted by EPA under RCRA Section 3004 or a state

authorized under RCRA Section 3006;

- Alternate to technology approved under 40 CFR 761.60(e), which is summarized in Section 4.2.2;
- Decontamination per 40 CFR 761.79;
- Thermal decontamination (for metal surfaces in contact with PCBs) per 40 CFR 761.79(c)(6); and
- TSCA Coordinated Approval issued under 40 CFR 761.77.

#### 4.5.2 Solid Waste Landfills

The requirements for disposing PCB bulk product waste in a solid waste landfill depends on whether the waste is presumed or known to leach < 10 Fg of PCBs /L. There are recordkeeping requirements in either case.

##### 4.5.2.1 Leaching < 10 Fg of PCBs /L

PCB bulk product waste presumed to leach < 10 Fg of PCBs /L may be disposed in a solid waste landfill provided it is permitted, licensed, or registered by a state as a municipal or non-municipal, non-hazardous waste landfill [40 CFR 761.62(b)(1)]. Waste presumed to leach < 10 Fg of PCBs /L are those in which PCBs are tightly bound within a matrix. EPA lists the following as included in such waste:

- Plastics (e.g., plastic insulation from wire or cable; radio, television, or computer casings; vehicle parts; or furniture laminates);
- Preformed or molded rubber parts and components;
- Applied dried paints, varnishes, waxes, or other similar coatings or sealants;
- Caulking;



#### 4. Disposal of PCB Waste

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- Galbestos;
- Non-liquid building demolition debris; and
- Shredder fluff [such as shredding from automobiles or household appliances from which PCB Small Capacitors have been removed. If a PCB Small Capacitor is shredded such that PCBs are no longer enclosed, dispose the shredding under the performance-based or risk-based option (Sections 4.5.1 or 4.5.3, respectively)].

All other PCB bulk product waste [sampled per Subpart R (40 CFR 761.340 to 761.359)] that leaches < 10 Fg of PCBs /L of water using a procedure to simulate leachate generation may be also be disposed in the aforementioned landfills.

If you dispose at such a landfill that is off-site without a commercial PCB storage or disposal approval, you must notify the landfill at least 15 days prior to the first shipment of the waste. The written notice must state that the PCB bulk product waste:

- May include components with PCBs at \$ 50 ppm based on
  - S General knowledge of the waste stream based on prior testing by the disposer or others,
  - S Sampling per Subpart R followed by analysis, or
- Is presumed or known to leach < 10 Fg of PCBs /L.

A one-time notification is required for each wastestream [40 CFR 761.62(b)(4)(i)]. However, if the wastestream changes (e.g., from automobiles to household appliances), a new one-time notification must be sent for the new wastestream. Each different demolition project is considered a new or different wastestream.

The owner/operator of the landfill is responsible for cleanup of any releases of PCBs (including leachate) from the landfill. Releases of PCBs

(including the leachate) from the landfill are cleaned up as PCB remediation waste (see Section 4.4.2) [40 CFR 761.62(b)(3)].

##### 4.5.2.2 Leaching \$10 Fg of PCBs /L

Examples of materials presumed or known to leach \$10 Fg of PCBs /L include paper or felt gaskets contaminated with PCBs and fluorescent light ballasts with PCB potting material. Such materials may be placed [40 CFR 761.62(b)(2)] into a landfill that is permitted, licensed, or registered by a state to manage municipal solid waste under 40 CFR Part 258 or non-municipal, non-hazardous waste under 40 CFR 257.5 through 257.30 provided that:

- PCB bulk product waste is segregated from organic liquids disposed in the landfill, and
- Leachate is collected from the landfill and is monitored for PCBs.

Releases of PCBs (including the leachate) from the landfill are cleaned up as PCB remediation waste (see Section 4.4.2) [40 CFR 761.62(b)(3)].

If you dispose at such a landfill that is off-site without a commercial PCB storage or disposal approval, you must notify the landfill at least 15 days prior to the first shipment of the waste and with each shipment thereafter [40 CFR 761.62(b)(4)(ii)]. The written notice must state that the PCB bulk product waste:

- May include components with PCBs at \$ 50 ppm based on general knowledge or analysis of the waste, and
- Is presumed or known to leach \$10 Fg of PCBs /L.

Unlike the one-time notification for PCB bulk product waste presumed or known to leach < 10 Fg of PCBs /L, notification must be made with every shipment to a landfill of PCB bulk product waste presumed or known to leach \$10 Fg of PCBs /L.

### 4.5.2.3 *Marking and Recordkeeping*

If PCB bulk product waste is put into a solid waste landfill, a record of all sampling and analysis of PCBs and required notifications (to be specified below) must be kept for three years from the date of the waste generation [40 CFR 761.62(b)(5)]. You must make the records available to EPA upon request. Note that Subparts J and K (40 CFR 761.180 to 761.218), “PCB Waste Disposal Records and Reports,” does not apply to PCB bulk product waste disposed in solid waste landfills. Also, Subpart C (40 CFR 761.40 to 761.45), “Marking of PCBs and PCB Items,” does not apply to PCB bulk product waste disposed in solid waste landfills [40 CFR 761.62(b)(6)].

### 4.5.3 *Risk-based Option*

PCB bulk product waste may be disposed upon approval in a manner other than that prescribed in either the performance-based option or a solid waste landfill described above [40 CFR 761.62(c)]. To do so, apply in writing to the EPA Regional Administrator for the site where the disposal will occur, or the Director, National Program Chemicals Division, for disposal sites in more than one region. In the application, provide data showing that the proposed disposal method and location will not pose an unreasonable risk of injury to health or the environment. The data should consist of technical, environmental, or waste-specific characteristics.

EPA may request other information necessary to make a decision. Do not dispose waste under the risk-based option prior to receiving written approval from EPA. EPA does not specify the criteria used for decisionmaking. However, EPA will consider the:

- Nature and quantity of the wastes,
- Proposed design of the disposal operation,
- Hydrogeologic setting of the disposal location (including attenuative capacity and thickness of the soils and liners present between the waste and ground or surface water), and
- Any other factor influencing the quality and

mobility of the leachate produced and the potential for it to migrate to ground or surface water.

EPA will respond in writing to each application. EPA will approve an application if it agrees that the proposed disposal poses no unreasonable risk.

Be advised that EPA intends to subject applications for risk-based disposal to a public hearing process [63 FR 35410]. The public hearing process may cause project delays.

### 4.5.4 *Disposal as Landfill Cover or Roadbed Material*

Bulk PCB product waste described in Section 4.5.2.1 (namely, presumed or known to leach < 10 Fg/L of PCBs) may be disposed [40 CFR 761.62(d)] as:

- Landfill cover as long as the daily cover remains in the landfill and is not released or dispersed by wind or other action, or
- Roadbed material under asphalt.

## 4.6 *PCB/Radioactive Waste*

Special provisions apply to PCB/radioactive waste with ≤ 50 ppm PCBs. 40 CFR 761.50(b)(7) specifies that, in disposing of PCB/radioactive waste, you must take into account both the PCB concentration and the radioactive properties of the waste.

If, in taking into account only the properties of the PCBs (and not the radioactivity), the waste meets the requirements for disposal in a facility permitted, licensed, or registered by a state as a municipal or non-municipal, nonhazardous waste landfill, then you may dispose of the PCB/radioactive waste on the basis of only the radioactive properties of the waste (and not the properties of the PCBs). Exhibit 4-9 lists the types of PCB/radioactive waste that may be placed in a landfill approved for radioactive waste without further regard to PCBs. All of these wastes are non-liquid.

#### 4. Disposal of PCB Waste

### Exhibit 4-9. PCB/Radioactive Waste that May Be Put into Radioactive Waste Landfills without Further Regard to PCBs

Type of PCB/Radioactive Waste	Examples	CFR Citation
Dewatered Bulk PCB Remediation Waste with < 50 ppm of PCBs	soil contaminated with heat transfer fluid	40 CFR 761.61(a)(5)(i)(B)(2)(ii)
Drained carcass of PCB-Contaminated Electrical Equipment	transformer, voltage regulator	40 CFR 761.60(b)(4) 40 CFR 761.60(b)(6)(ii)(A)
PCB Bulk Product Waste leaching < 10 µg of PCBs/L	concrete coated with fire-retardant paint	40 CFR 761.62(b)(1)(i)
Non-liquid cleaning materials and personal protective equipment wastes at any PCB concentration from decontamination	brushes, booties, gloves, rags	40 CFR 761.79(g)(6)
Non-liquid cleaning materials and personal protective equipment waste at any PCB concentration from self-implementing remediation site cleanups	brushes, booties, gloves, rags	40 CFR 761.61(a)(5)(v)(A)
Non-liquid wastes from research and development activities	glassware, tubing, spatulas, filter paper	40 CFR 761.64(b)(2)

For example, PCB bulk product waste, which is also PCB/radioactive waste (which may be put into a solid waste landfill if nonradioactive) must be disposed in a landfill approved under the Atomic Energy Act (DOE Order 435.1 or other applicable implementing provisions). In the event a PCB/radioactive waste may be put into a chemical waste landfill, if nonradioactive, then you must use a landfill that is approved under both TSCA (40 CFR 761.75) and the Atomic Energy Act (DOE Order 435.1 or other applicable implementing provisions).

#### 4.7 Waste from Research and Development Activities

Waste from research and development activities is defined in Section 2.6. [Note that waste from activities conducted for purposes of research and development into PCB disposal [described in 40 CFR 761.60(j)] are covered in Section 4.9]. The

disposal requirements for such waste are based on size. If the size is greater than the portion designated by a particular method, the disposal depends on whether the waste is liquid or non-liquid.

##### 4.7.1 Size

Portions of samples of a size designated in a chemical extraction and analysis method for PCBs and extracted for purposes of determining the presence of or concentration of PCBs are unregulated for PCB disposal. This waiver is set forth at 40 CFR 761.64(a).

##### 4.7.2 Liquids

Liquid solutions, including rinse solvents, generated from research and development activities, are disposed as liquid PCB remediation wastes (see Section 4.4.2.1 and Exhibit 4-5). You may dispose

them based on their concentration at the time of disposal [40 CFR 761.64(b)(1)].

### 4.7.3 Non-Liquids

Disposal of non-liquid PCB waste from research and development activities [40 CFR 761.64(b)(2)] is the same as that for non-liquid cleanup materials and personal protective equipment given for PCB remediation waste (see Section 4.4.2.1 and Exhibit 4-6).

## 4.8 Decontamination Wastes and Residues

Disposal of decontamination wastes and residues depends on whether they are liquid or non-liquid.

### 4.8.1 Liquids

Disposal of liquid decontamination waste depends on the type of solvent and the concentration of PCBs.

Hydrocarbon-solvent decontamination waste [40 CFR 761.79(g)(3)] with < 50 ppm of PCBs must be:

- Marketed (if applicable) and burned per the requirements at 40 CFR 761.20(e),
- Disposed as a PCB liquid by combustion (see Section 4.2.1) or an alternative to combustion (Section 4.2.2), or
- Decontaminated per 40 CFR 761.79.

Chlorinated-solvent decontamination waste [40 CFR 761.79(g)(4)] at any PCB concentration must be:

- Incinerated as specified in 40 CFR 761.70, or
- Decontaminated per 40 CFR 761.79.

EPA has imposed rather stringent requirements for disposal of chlorinated-solvent decontamination waste in order to discourage the use of such solvents.

Solvents (other than those that are chlorinated) containing  $\leq$  50 ppm of PCBs as the result of decontamination use [40 CFR 761.79(g)(5)] must be:

- Disposed as a PCB liquid at their existing concentration by combustion (see Section 4.2.1), or
- Decontaminated per 40 CFR 761.79.

Disposal of liquid distillation bottoms or residues and filters are discussed below under “Non-Liquids.”

PCB liquids from oil/water separation are regulated for disposal at their original concentration. See Section 4.2.1 for disposal of PCB liquids by combustion.

### 4.8.2 Non-Liquids

Distillation bottoms or residues and filter media are regulated [40 CFR 761.79(g)(1)] for disposal at their existing concentration as PCB remediation waste; they may be disposed in accordance with Exhibits 4-4 and 4-6.

PCBs (other than distillation bottoms or residues and filters) physically separated during decontamination by chopping, shredding, scraping, or abrading (as opposed to solvent rinsing and soaking) are regulated [40 CFR 761.79(g)(2)] for disposal at their original concentration. See Section 4.5 for disposal of PCB bulk product waste.

Non-liquid cleanup materials and personal protective equipment waste at any concentration, including nonporous surfaces and other non-liquid materials, such as rags, gloves, and booties, and similar materials resulting from decontamination, must be disposed [40 CFR 761.79(g)(6)] as “Non-Liquid Cleanup Materials” (see Exhibit 4-6).

## 4.9 Research and Development into PCB Disposal

In the PCB Disposal Amendments, EPA provided for a self-implementing option for research and development of methods specifically for PCB

#### **4. Disposal of PCB Waste**

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disposal [40 CFR 761.60(j)]. Use of PCBs for research and development for other purposes are provided for elsewhere. [See 40 CFR 761.30(j) for the use of PCBs for chemical analysis, health effects studies, and environmental fate. See 40 CFR 761.30(k) for the use of PCBs in scientific instruments (e.g., mounting media for microscopy).]

EPA has prescribed several requirements under the self-implementing option for research and development of methods specifically for PCB disposal. These requirements include maximum amounts and notification.

The maximum amounts that may be used or treated in research and development studies are 500 gallons/year (liquid) and 70 cubic feet/year (non-liquid), neither of which may exceed 10,000 ppm of PCBs. The purpose of these maximum amounts is to limit the potential risk from incomplete or unsuccessful disposal of PCBs undertaken during research and development studies. The use of PCBs beyond these maximum amounts require an approval from the appropriate EPA Region [40 CFR 761.60(j)(2)].

Prior to exercising the self-implementing option, obtain an EPA Identification Number for a PCB waste handling activity if the site (where the research and development will occur) does not already have such a number. The number may be obtained by submitting a Form 7710-53 [40 CFR 761.205]. Once you have received a number, notify in writing the appropriate EPA Region and the state and local environmental protection agencies. The notification must provide the EPA Identification Number for the site, quantity of PCB waste to be treated, the types of disposal technology to be used, the general properties of the PCB waste to be treated, and estimated duration of the research and development. The notification must be submitted 30 days prior to commencing the self-implementing option but may be waived at EPA's discretion.